DOCUMENT RESUME

ED 223 408 SE 039 405

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TITLE Nebraska Energy Education-1982. An Evaluation.
INSTITUTION Nebraska State Energy Office, Lincoln.
PUB DATE Feb 82
NOTE 121p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Attitude Change; *Conservation Education; Curriculum Evaluation; Elementary Secondary Education; *Energy Conservation; Environmental Education; Interdisciplinary Approach; *Program Effectiveness; *Program Evaluation; *Student Attitudes; Teacher Attitudes; Units of Study
IDENTIFIERS *Energy Education; *Nebraska

ABSTRACT

To determine the success of Nebraska's 3-year effort in energy education, an evaluation was conducted to solicit data concerning the effectiveness of on-going energy curricula using teacher responses. These curricula include "Energy Conservation Activity Packets" (ECAP) for elementary programs and "Basic Teaching Units on Energy" (BTU) for secondary programs. An adjunct study was also conducted to assess student attitudes relative to energy conservation attitudes. Rationale for the evaluation, methodology, results (separate sections for ECAP and BTU results), conclusions, and recommendations are included. Supporting documentation in appendices includes: survey instruments and cover letters; non-analyzed ECAP and BTU project data; list of educational service units; dissemination methodology/samples; ECAP pilot schools; and adjunct study (attitudes) materials. Results (based on curriculum users) indicate a need for increased awareness of the existence of energy education curricula, greater administrative support for program implementation, and inservice programs. Results of the adjunct (attitude) study indicate little change in students' energy attitudes during 1979-81, no significant relationship between teacher and student energy attitudes, and a direct relationship between teacher attitudes and teacher concern about energy education as an innovation. The study also found that providing teachers with knowledge of their students' energy attitudes/behaviors increases teachers' "search behavior" for curricular alternatives. (Author/JN)

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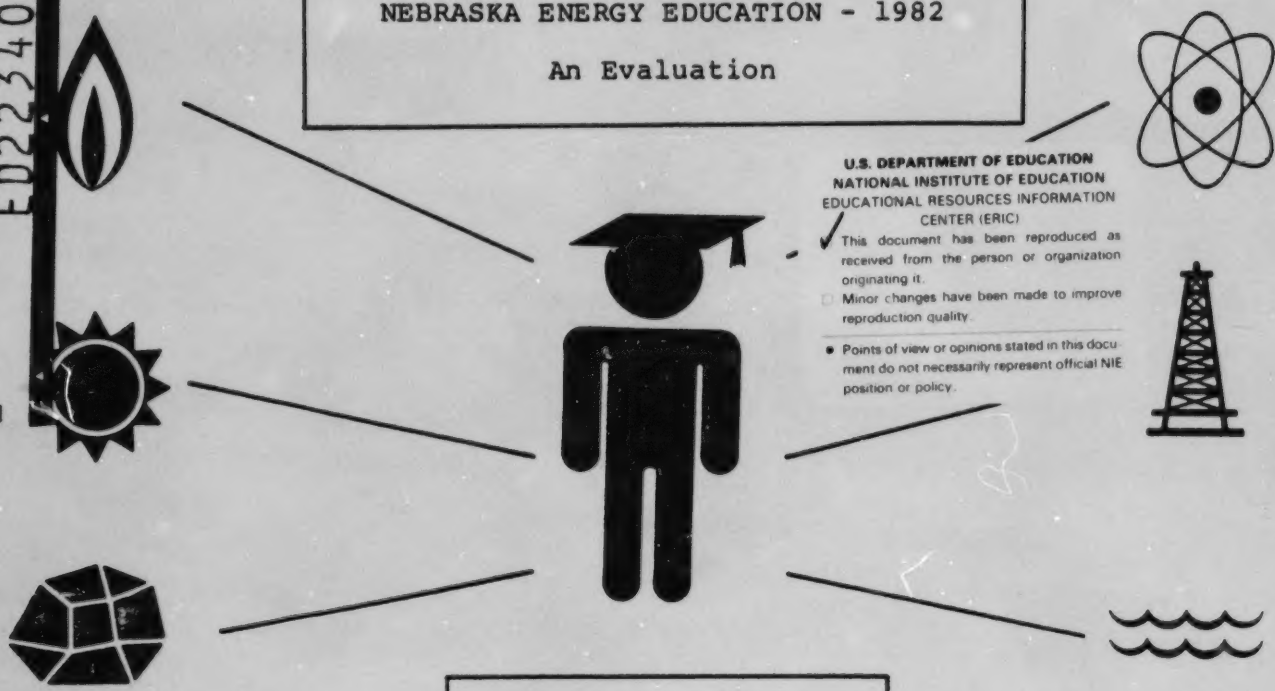
NEBRASKA ENERGY EDUCATION - 1982

An Evaluation



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PREFACE

Curriculum theorists have always extolled the benefits of the public school as an agent of social change. Rather than simply reflect our present society and change only when society demands, the school is idealistically portrayed as an institution capable of pioneering extensive social change. In reality, however, the public school system tends to reinforce societal values in a STATIC format rather than perform the task of refocussing our values in a DYNAMIC format. In the face of this reality, unfortunately, curriculum changes and innovations tend to be ignored until the public outcry becomes sufficient to warrant innovation or change.

Energy education is just one of many innovations making an effort to capture a share of the in situ static curriculum. In its infancy, the study of energy is attempting to promote a future of independent energy self-sufficiency so necessary for safeguarding the freedom of this nation. Truly, that promotion would be wonderous if it ever could come to fruition. But, can the school deliver so lofty a promise? Obviously not by itself! However, a concerted effort and commitment to energy education should, at least, be able to evoke a substantial change in attitude toward the useless waste of precious energy resources.

If the school is to make any difference toward accomplishing energy self-sufficiency, then the incorporation of energy education into the school curriculum must occur rapidly and without hesitation. Indeed, as it was stated at the Second Annual Practitioners Conference on Energy Education:

> The major goal of energy education is to produce an energy informed citizenry. Not to do so is dangerous in light of the ongoing problems that exist in this country.
>
> Student-citizens must not only understand the need for wise use of energy but also be equipped to make choices among energy options and be aware of energy career opportunities. The final test of the success of energy education will be the behavior of these student-citizens in the 1980's and beyond.[1]

The first problem in energy education is thus one of initiation. How do we begin to incorporate energy as a viable component in the school curriculum? Traditional curriculum specialists usually rely on a four-stage developmental cycle:

(A) Assessment of need;
(B) Curriculum development;
(C) Curriculum implementation; and
(D) Evaluation/revision.

Once assessment has been completed, curriculum development finished, and implementation begun, the second problem arises: determining the effectiveness of the energy education program thusfar initiated. Too often, curriculum development proceeds as far as the implementation phase and never receives proper input from its users. And, just as often, a program is evaluated, revised, and reissued without reassessing its impact relative to the original objectives. Therefore, for the school to effect any permanent change in relation to our energy attitudes, curriculum materials need to be evaluated and revised consistent with the long-range goal of an energy-literate society.

NEBRASKA'S PROGRAM

Nebraska's program in energy education curriculum development is considered accomplished in comparison to the efforts undertaken by other states.

> Nationwide teacher inservice is a necessity if energy issues are to pervade classrooms. The training should be coordinated at the state level like the model efforts in Florida, Michigan, and Nebraska.[2]

A major predicament results from this appraisal, however, because it is based on subjective, unsubstantiated opinion! While it is true that, when basing a judgement of programmatic success against the four-phase curriculum development model, Nebraska may be far ahead of other state's efforts, it says nothing about neither the quality nor the impact of Nebraska's program. Taken at face value, Nebraska's "model" label can only be construed as successful because Nebraska has proceeded as far as the implementation phase of the curriculum development scheme (while other states are still performing assessment studies). In order to fully judge the impact of Nebraska's program, it would be necessary to complete a statewide evaluation of all energy education efforts.

A second predicament results through the performance of an evaluation process. If the evaluation is to be successful, a mechanism must be provided to assess the program relative to the original objective: a change in the attitudes that students have toward energy and the reduction of its waste. Most educational evaluations, unfortunately, simply judge the impact of a program relative to the responses gathered from the users of that program. While the users (in this case teachers) do provide worthwhile input, their responses say nothing in regard to the ultimate product of the program; the students themselves.

There are two methods to remedy the forementioned predicament. One method would be to solicit student responses simultaneously with that of their teachers.[3] This method

assumes, however, that the program being evaluated is extensively utilized. Since Nebraska was attempting to ascertain the extent of statewide use, this method would not be applicable. A second method would involve the design of a study to complement the data being gathered on the original evaluation. While the latter process cannot assume direct correlation, it would be the best method of determining an indirect but reliable assessment of student attitudes.

Therefore, to determine the success of Nebraska's three-year effort in energy education, an evaluation was conducted to solicit data concerning the effectiveness of on-going energy curricula using teacher responses and an adjunct study conducted to assess student attitudes relative to energy conservation attitudes.[4] It is the intent of the Nebraska Energy Office that the results of this study be used by its readers to:

(A) Guide the development of a successful program in energy education;

(B) Serve as a blueprint for implementing changes in school districts;

(C) Serve as a model for other state's efforts in determining the success of their programs in energy education; and

(D) Document the status of Nebraska's energy education program.

Larry Scharmann, M. Ed.
Education Coordinator
Nebraska Energy Office
February, 1982

INTRODUCTION

History and Development

The Nebraska Energy Office (NEO) came into existence on September 3, 1977, as a result of legislation passed by the Nebraska Unicameral. One of the functions of the Nebraska Energy Office is to provide for public education. To meet this legislative mandate, the NEO initiated an extensive assessment of educational needs and began a nationwide search for pre-existing energy education curricula.

A program was acquired from the Iowa Energy Policy Council, as a result of this nationwide search, entitled "Energy Conservation Activity Packets" (ECAP).[5] The ECAP program substantially met the requirements for initiating an elementary, grades K-6, curriculum. Permission was obtained from the Iowa Energy Policy Council for reproduction rights and the ECAP program was revised for Nebraska use. The ECAP were subsequently field-tested in 38 Nebraska school districts during the 1978-79 school year and made available statewide in the 1979-80 academic year. (See Appendices, page 95).

The nationwide search did not, however, discern a program to meet the requirements for effecting a comprehensive secondary, grades 7-12, curriculum. Instead, with the support of a United States Department of Energy "Faculty Development Grant," the NEO promoted the independent development of a series of instructional units entitled "Basic Teaching Units on Energy" (BTU). The BTU program was written at the University of Nebraska, under the auspices of the NEO, by the participants attending the three-week Faculty Development Institute (summer, 1978). This Institute enabled the NEO to edit and print the original 14 BTU. The BTU were field-tested in each participant's school district during the 1978-79 school year and subsequently made available statewide in the 1979-80 academic year. An additional 8 units were written by independent authors in the summer of 1979 and the final 8 units were developed as a result of a second federal faculty development grant (summer, 1980).

Implementation

Upon completion of the development of Nebraska's K-12 curricula, a plan for implementation was designed to disseminate materials. A variety of methods were utilized including:

1. Field-testing;
2. Direct Mailings;
3. In-service conventions;
4. Summer teacher training workshops;

5. Direct in-service via school district request; and
6. Development of a clearinghouse network through Nebraska's statewide Educational Service Units.

A more complete account of dissemination methods is described below.

Energy Conservation Activity Packets (ECAP)

Initial implementation of the ECAP program was begun in conjunction with the field-test experiment at 38 elementary schools throughout Nebraska. The experiment was administered by elementary teacher supervisors at Chadron, Kearney, Peru, and Wayne State Teacher Colleges and at the University of Nebraska-Lincoln. Teachers at the 38 schools were introduced to the materials, given training in their use, and asked to use them during the first half of the 1978-79 academic year. A follow-up, performed in the Spring of 1979, indicated that 30 schools were still using ECAP. No other follow-up, however, was performed.

The remainder of the ECAP implementation was performed via methods previously described. The majority of this activity consisted of direct mailing response to advertisements in various educational newsletters.

Basic Teaching Units on Energy (BTU)

Primary implementation of the BTU program was performed as part of a contractual agreement between the NEO and the participants of the federal faculty development grant. The performance of this grant was delivered in the summer of 1978 at a three-week Energy Institute conducted at the University of Nebraska-Lincoln. Participants were required, in order to obtain 3 graduate credit hours, to submit an instructional unit on energy topics supplied by the NEO. Participants were further required, in order to obtain a stipend, to field-test all instructional units developed by themselves and those of their colleagues. Field-testing was accomplished in the 1978-79 academic year. No follow-up was performed, however, to assess the impact of the field-test experiment.

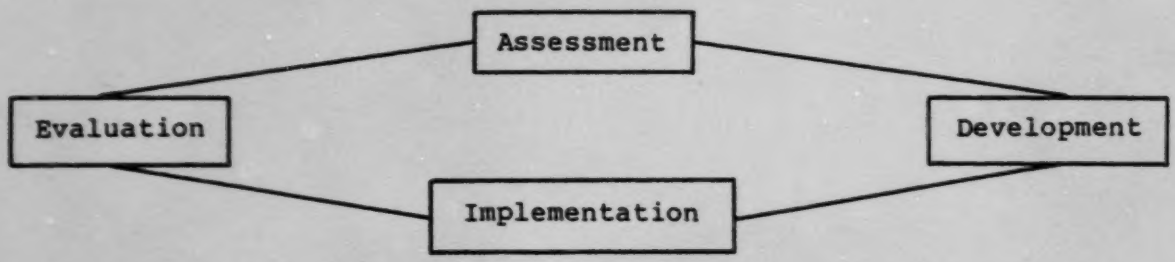
As was the case for the ECAP, the remainder of the BTU implementation took place through previously described methods. Teacher response to advertisements was, once again, the preferred methodology.

RATIONALE FOR EVALUATION[6]

Four components essential in establishing and maintaining a successful educational program are:

1. Assessment of need;
2. Development of appropriate instructional materials;
3. Implementation schemata; and
4. Evaluation.

These four components can be integrated into a cyclic framework in which each component exists as a separate entity and as a dependent constraint. The relative progress of any educational program can be appraised by denoting its position within the holistic cycle.



Thus, in assessing the relative progress of Nebraska's major K-12 curriculum projects (ECAP and BTU), it was noted in October, 1980 that the ECAP and BTU had reached the third stage of a four-phase cycle. Indeed, since their inception, the ECAP and BTU projects had been operating for approximately two years without objective documentation of their effectiveness. Therefore, in 1981, the Nebraska Energy Office committed itself to evaluating both the validity and relevancy of the ECAP and BTU projects. Once completed, one full cycle will have been realized and both curriculum projects can be reassessed relative to the original goals of Nebraska's commitment to energy education.

EXPECTED OUTCOMES

As it was stated in the Preface, it would not be possible to completely evaluate any curriculum without the development of a secondary instrument or by administering similar surveys to students simultaneous with those evaluations written by their teachers. Nebraska chose to administer an independent study of student attitudes to complement the results determined by teacher

users. The results of these two studies complement each other in their ability to project a thorough appraisal of the following expected determinations regarding the ECAP and BTU projects:

1. Extent of statewide use;
2. Effectiveness of the projects;
3. Quality of the projects;
4. Revision work required; and
5. A method to improve Nebraska's statewide services.

NOTE: This document will concentrate on the development, implementation, and substantiation of data collected from the instrument completed by the users of Nebraska's ECAP and BTU projects. Information will be reported from the complementary adjunct study, "Implementing Energy Education: Focusing on Attitudes and Concerns", only where the results, conclusions, and recommendations, have valid applications supplemental to the body of this text.

METHODOLOGY

A search of current literature and educational journals was conducted prior to the design of a survey to assess the progress of Nebraska's energy education curricula. The search was conducted in hopes of determining specific criteria for measurement concerning energy related curricula. Unfortunately, the only study of reputed relevance was conducted by Battelle's Columbus Laboratories and reported in a document entitled, "Review and Evaluation of DOE Energy Education Curriculum Materials," October 1979.(7). The Battelle study reported that "No other research studies were identified dealing with actual extent of use of materials in our schools."(8, 9). Thus, while it is disappointing not to find sufficient resource material with which to generate a survey instrument, it is concurrently exciting to know that the research is indeed, original. (See Appendices for copies of both cover letters and survey forms.)

Sampling Technique

To adequately assess the extent of statewide use, effectiveness of both the ECAP and BTU projects, and total numbers of students exposed to NEO energy curricula, it was determined that a response rate equal to 25% of all Nebraska school districts would suffice. A rate of 25% was chosen in preference to the standard educational measurement of 10% to eliminate a positively skewed response from ECAP and BTU users and field-test districts. A survey of this type would most naturally discriminate against those potential respondents who never have had knowledge of either project's existence! Therefore, great care was taken to solicit respondents without prior knowledge of either project. The results, generated by this study, were still heavily skewed toward the ECAP and BTU user, but a response rate of 25% more accurately reflects the status of NEO program efforts.

Mailing lists were obtained from the Nebraska State Department of Education, for all of the following groups:

1. Elementary school principals;
2. Secondary social studies teachers; and
3. Secondary science teachers.

Each list was generated utilizing one constraint factor: to obtain a randomly chosen set of names equaling one-half of all possible names. Each participant was mailed a cover letter, evaluation survey, and prepaid return mail envelope. Thus, with the return of 50% of all mailings, the NEO would be assured of a 25% target population. The actual numbers were:

Elementary population = 29.8%
Secondary population = 32.0%

The response rate was considered, therefore, to be valid and analysis subsequently reliable within a 95% degree of accuracy.

Note: A 95% degree of reliable accuracy was determined from the following formula:

(Number of Respondents) - (Number of mailings x 25%) $\geq$ 0.

Limitations

Two factors were considered to be limiting in analyzing the results of this study:

1. Elementary (ECAP) surveys were sent to the principal instead of an individual teacher; and
2. Sample size for respondents indicating previous knowledge and use of ECAP and BTU projects was very small and difficult to fully analyze.

The first limitation was actually intended for incorporation into the study design. The precept of this incorporation was to attempt an understanding of school district communications. It was prescient knowledge that many principals would react differently. Some principals would ask members of their staff if they were actually using the ECAP project, while others would not. Other principals would turn the survey materials directly over to an elementary staff member. In actuality, the reactions each occurred about 50% of the time. Unfortunately, this method had a tendency to lower the potential user rate and contributed to the second limitation.

The second limitation was also performed by design. In order to determine the extent of statewide use, a randomization factor was included as described previously. While this limitation was effective in determining the status of use, it did not allow for the potential participation of more than one staff member. This factor would thus limit the amount of useful information for revision purposes. Many school districts did, however, circumvent this problem by photocopying the number of surveys needed and returning multiple responses. When this was performed, an average was calculated for multiple responses and numbers totaled consistent with the original survey design. The second limitation was further compatible with survey design due to the anticipation of a small user rate. Because, according to the Battelle study,

The extent to which secondary (and elementary) science, social studies, and mathematics teachers use National Science Teachers Association developed materials appears to be low, in that only 4 percent of responding teachers indicated any use of these materails in their classes. This figure of 4 percent may even be high, because of the expected tendency of users of the materials to return the questionnaire forms.[10]

RESULTS

Contents

-Overview

-Energy Conservation Activity Packets (ECAP)

-ECAP Summary

-Basic Teaching Units (BTU)

-BTU Summary

RESULTS

Data, obtained as a result of this evaluation, were separated into two categories: those for analyses and those for generic informative purposes. Data selected for analyses are discussed in this section and those for generic informative purposes are listed in the appendices. Questionnaire responses were compiled using an IBM computer terminal and processed with an EASYTRIEVE statistical software package. The reader is cautioned against making generalizations without first considering methodological limitations inherent to the study design. The results cannot, therefore, be construed as being comprehensive without directly interviewing the respondent population.

ENERGY CONSERVATION ACTIVITY PACKETS

The initial question of interest to the NEO administration was not if Energy Conservation Activity Packets were being used, but instead, was the teacher population of the state making presentations on the subject of energy. Table 1 reflects this question for elementary teachers:

- -

Table 1

Energy Presentations Made

Response	n	%
Yes	101	62.3
No	61	37.6
Totals	n=162	99.9%

Of the 101 teachers responding favorably to making energy presentations, the average number of presentations was about four per academic year ($\bar{X} = 3.61$). Thus, if over 60% of the responding teachers saw a need for presenting at least two energy sessions per semester, the NEO was interested in the informational source utilized by these teachers in providing instruction. Table 2 presents the extent and source of primary teacher resource material.

Table 2

Curriculum Materials Ordered

Title	Source	n	%
Energy Conservation Activity Packets	Nebraska Energy Office	34	19.8
Science Activities in Energy	U.S. Dept. of Energy	11	6.4
Project For an Energy Enriched Curriculum	National Science Teachers Association	0	0.0
Energy and Man's Environment	The EME Inc.	1	0.6
No Materials Ordered		125	73.0
Totals		n=171	99.8%

The obvious conclusion for the n=171 is that some teachers are using more than one resource in preparation for energy instruction. In assessing the extent of statewide use for the NEO ECAP project, we were pleased to know that nearly 20% of the responding elementary teachers had at least ordered the ECAP curriculum. This did not, however, guarantee that the project was being utilized.

Table 3

Curriculum Materials Used		
Response	n	%
Yes	20	12.3
No	143	87.7
Totals	n=163	100.0%

Curriculum Materials Used		
Response	n	%
Yes	20	58.8
No	14	41.2
Totals	34	100.0%

- -

It is interesting to note that the ECAP project constitutes the only source, of energy education curricula available, actually being utilized in Nebraska elementary schools. This fact, however, is still disconcerting considering the three-year effort that the NEO has put forth in disseminating the project. Twenty users do not even approach the 38-school voluntary pilot program. Checking against all records of distribution numbers, the NEO had estimated a 65% statewide coverage factor over and above the 38-school pilot program. To find that, of over 300 schools requesting ECAP, only 20 schools report usage, suggests that either the program is poor or that effective communication is remiss. Thus, the NEO was interested in data regarding reasons for not using the ECAP curriculum specifically and not including energy curricula generally. Tables 4 and 5 address this concern

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Table 4

Reasons for Not Using Energy Curricula

Reason	n = 129	%
Limited Class Time	32	24.8
Doubt Usefulness	4	3.1
Doubt Relevance	3	2.3
No Time to Evaluate	34	26.4
Energy Education is Unnecessary	1	0.8
Didn't Know Materials Existed	71	55.0

Table 5

Reasons for Not Using ECAP

Reason	n = 14	%
Limited Class Time	11	78.6
Doubt Usefulness	0	0.0
Doubt Relevance	1	7.1
No Time to Evaluate	11	78.6
Energy Education is Unnecessary	4	28.6
Didn't Know Materials Existed	0	0.0

- -

Response tallies in Tables 4 and 5 exceed the participant total because more than one choice was available and permitted by design.

In both Tables, a large percentage of the teachers indicated that little time was available for energy education to be included in the curriculum. These responses support the contention made in the Preface that schools need to place a higher priority on energy education before any state or federal project can command a share of the total school curriculum. The fact that teachers indicate no knowledge of existing materials (Table 4) suggests a need for more direct promotional activities on the part of the Nebraska Energy Office, and its dissemination network.

The next phase of analyzing the ECAP project concerns the overall quality of the program as rated by its users. The schools responding favorably to the use of the ECAP project can be found in Table 6. The Table also references the year and month ECAP was obtained, the number of times used, and the number of students exposed to the project.

Table 6

Schools Using ECAP

School	City	Year	Month	Times Used	# of Students
Arapahoe Elementary	Arapahoe	80	01	1	45
*Buffalo Elementary	North Platte	79	11	3	80
*Central Elementary	Plattsmouth	78	09	3	90
Cody Elementary	Millard	79	11	2	140
Eagle Elementary	Eagle	80	02	2	100
East Elementary	Minden	79	03	2	160
*Eisenhower Elementary	North Platte	79	11	2	40
Gretna Elementary	Gretna	80	02	2	75
Hamlow Elementary	Waverly	80	11	1	75
Holy Family Elem.	Lindsay	80	10	1	50
Inman Elementary	Inman	80	04	8	35
*Mary Lynch Elementary	Kimball	79	04	4	142
*Laurel Elementary	Laurel	79	02	2	120
Lincoln School	North Platte	80	03	1	60
McDonald Elementary	North Platte	80	11	9	52
McKinley Elementary	Gering	80	11	1	33
North Ward Elementary	McCook	80	11	1	45
Randolph Elementary	Randolph	80	02	2	45
*Seward Elementary	Seward	78	09	9	70
Stoddard Elementary	Beatrice	81	01	1	80
Totals				57	1,537

*Denotes a member of the original pilot test group. From this data, therefore, 7 out of 38 original pilot test group schools reported continued use of the ECAP project.

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Table 7

Projected Statewide Student Impact (ECAP)

Number of mailings = 546

Number of responses = 163

Response rate = $\frac{163}{546}$ x 100% = 29.8%

Proportional Statewide Student Impact: $\frac{1537}{29.8\%} = \frac{x}{100\%}$

Impact = x = 5,158 students

The total of 5,158 students may be substantially greater than the actual number of students affected, because the proportion assumes that equal numbers of non-users and users did not respond to the study. It can be assumed, however, that more teachers would respond to the questionnaire if they have used the ECAP project. Therefore, the proportion is positively biased and the number of students having received instruction using ECAP is actually lower than 5,158. Yet, while the number of school districts and students having used ECAP may be lower than anticipated, this population data is effective in judging the program's quality. Table 8 depicts qualitative ECAP data.

Table 8

ECAP Qualitative Data

Question	$\bar{X}$	n
D. Material Applicability within Curriculum	4.00	20
E. Student Interest in Material	4.10	20
F. Content Applicability to Student Background	3.80	20
G. Content Relevancy	3.75	20
H. Geographic Relevancy	3.75	20
I. Validity of Learning Activities	3.80	20
J. Impact on Student Awareness and Understanding	3.75	20
	3.85	140

The means ($\bar{X}$) depicted in Table 8, were calculated by tabulating teacher responses to a five-point Likert scale and dividing by the total number of respondents. The most positive response was equal to 5 and the most negative equal to 1. General satisfaction was determined to be any mean greater than 3.5. Using this criterion, it would appear that the content, validity, and relevancy of the ECAP project was successful. No determination has been performed, however, for the reasons why pilot-test school districts have discontinued use of the ECAP. The data does not indicate a need for substantial revision, but it does indicate a need for intensive direct in-service and extensive statewide promotion. Other factors, contributing to the conclusion that the ECAP project has been successful, can be found in Tables 9-10. Additional factors, supporting the need for direct in-service and promotion, can be found in Tables 11-12.

Table 9

ECAP Reading Level

Response	n	%
Appropriate	17	85.0
Too High	3	15.0
Too Low	0	0.0

Table 10

ECAP Technical Level

Response	n	%
Appropriate	18	90.0
Too High	1	5.0
Too Low	1	5.0

Table 11

Necessity for ECAP In-Service

Response	n	%
Yes	15	75.0
No	5	25.0

Table 12

Factors Hindering the Use of ECAP

Response	n	%
None	6	30.0
Too much time required	9	45.0
Space required	1	5.0
Equipment required	5	25.0
Doesn't fit curriculum	1	5.0
No Administrative support	3	15.0

It is interesting to note that 60% of the teacher users indicate a lack of time available and poor administrative support. Teachers, it would seem, feel that if energy education is to be taught in their classrooms, then it must be performed as a sacrifice to other curricular activities. Direct in-service for combined teacher/administrator groups might alleviate this concern.

ECAP Project Summary

1. 60% of all Nebraska elementary teachers responding to this study cover energy topics in their daily instruction. They average 4 sessions per academic year and 2 sessions per semester term.

2. 20% of this same teacher population reported that their school district possessed a complete set of Energy Conservation Activity Packets.

3. The ECAP project accounts for 100% of all reported formal energy education curriculum use.

4. The ECAP program represents a 12.3% share of total statewide coverage.

5. A positively biased estimate of 5,158 students have received instruction by the ECAP project.

6. The two major reasons for the low extent of statewide use for ECAP appear to be: lack of knowledge for the existence of the project and too little time available in the total curriculum for implementation of the project.

7. Teachers reporting use of the ECAP project appear to be generally satisfied with its content, relevance, and validity.

8. The ECAP project will be more successful in terms of statewide use with direct in-service, extensive statewide promotion, and intensive follow-up activity.

BASIC TEACHING UNITS ON ENERGY

The Basic Teaching Units (BTU) project is a grades 7-12 secondary curriculum package of immense diversity. It is composed of a series of 30 instructional units for use in the academic disciplines of science, social studies, economics, industrial arts, agriculture, and mathematics. Because the project encompasses such a wide variety of subjects, the study design was much more difficult than for the ECAP project. Yet, since the majority of the units deal with either science or social studies, these two areas were selected for evaluation. As was true for the ECAP project, the NEO was initially interested in whether or not the secondary teacher population was making presentations on the subject of energy. Table 13 reflects this question for secondary teachers:

Table 13

Energy Presentations Made

Response	n	%
Yes	182	54.1
No	154	45.8
Totals	336	99.9%

In the case of secondary teachers, 6% fewer respondents saw energy as a priority for instruction than did the elementary teachers (Table 1). Of the 182 teachers responding favorably to making energy presentations, the average number of presentations was about three per academic year ($\bar{X} = 3.35$). This mean, however, is also lower than the elementary average. The NEO had assumed that if a problem existed in promoting the need for energy education, it would be at the elementary level. The NEO was not surprised at the average number of sessions. Energy education has, like environmental education, been considered a higher priority for and an almost exclusive perogative of the secondary science curriculum. This response, therefore, was different than the expected outcome. However, if over 50% of the responding teachers were presenting energy sessions, the NEO was interested in the informational source utilized by these teachers in providing instruction. Table 14 presents the extent and source of secondary teacher resource material.

Table 14

Curriculum Materials Ordered

Title	Source	n	%
Basic Teaching Units On Energy	Nebraska Energy Office	57	16.9
Project For an Energy Enriched Curriculum	National Science Teachers Association	12	3.6
Energy and Man's Environment	The EME Inc.	9	2.7
No Materials Ordered		278	82.7
Totals		n=356	99.8%

- -

The percentage of teachers using secondary materials is much lower than the expected outcome. Secondary teachers did, however, exhibit greater diversity in their use of different resource material in preparation for energy instruction. In assessing the extent of statewide use for the BTU project, Table 14 indicates that nearly 17% of the responding secondary teachers acknowledge the existence of the BTU curriculum. Once again, as with the ECAP project, ordering of materials does not indeed guarantee the utilization of the BTU curriculum.

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Table 15

Curriculum Materials Used			Curriculum Materials Used		
Response	n	%	Response	n	%
Yes	30	8.9	Yes	30	52.6
No	305	91.1	No	27	47.4
Totals	335	100.0%	Totals	57	100.0%

- -

The results of Table 15 indicate that the BTU project (like ECAP) constitutes the only source of available energy education curricula actually being utilized in Nebraska secondary schools. The fact that other national curriculum programs were ordered by

the schools means little, since all 30 teachers use the BTU project. However, the NEO had estimated a 60% statewide coverage factor based on all available dissemination records. Thus, the NEO was again interested in the data regarding reasons for not using the national curriculum programs and more specifically, reasons why teachers are not using the BTU curriculum. Tables 16 and 17 address this concern.

- -

Table 16

Reasons for Not Using Energy Curricula

Reason	n = 295	%
Limited Class Time	76	25.8
Doubt Usefulness	30	10.2
Doubt Relevance	23	7.8
No Time to Evaluate	153	51.9
Energy Education is Unnecessary	30	10.2
Didn't Know Materials Existed	78	26.4

- -

Table 17

Reasons for Not Using BTU

Reason	n = 27	%
Limited Class Time	15	55.6
Doubt Usefulness	5	18.5
Doubt Relevance	2	7.4
No Time to Evaluate	13	48.1
Energy Education is Unnecessary	4	14.8
Didn't Know Materials Existed	16	59.3

- -

Response tallies in Tables 16 and 17 exceed the participant total because more than one choice was available and permitted by design.

In both Tables, a large percentage of the teachers indicated that little time was available for the evaluation of energy education curricula let alone attempting to incorporate the materials. Comparing the BTU project results with those of the ECAP project, it was noted that although secondary teachers were more aware of the existence of the BTU project, more teachers

doubted the validity of energy education programs. This fact was heavily prevalent among administrators since 59.3% of the secondary teachers indicated that they receive little support for incorporating energy education from their administration. Once again, these results support the contention made in the Preface that schools need to place a higher priority on energy education before it can support the national effort of energy self-sufficiency. The fact that 26.4% of the secondary teachers have no knowledge of the BTU project and those that do rarely use them, suggests a need for more direct promotional activities on the part of the NEO, and its dissemination network.

The next phase of analyzing the BTU project concerns the overall quality of the program as rated by its users. The schools responding favorably to the use of the BTU project can be found in Table 18. The Table also references the year and month BTU was obtained, the number of times used, and the number of students exposed to the project.

- -

Table 18

Schools Using BTU

School	City	Year	Month	Times Used	# of Students
Adams Public	Adams	80	04	1	22
Alliance Middle School	Alliance	80	10	6	123
Aquinas High School	David City	80	08	1	8
Barneston Consolidated	Barneston	80	12	2	85
Barneston High School	Barneston	80	11	2	25
Bryan Center	Lincoln	79	09	7	7
Columbus High School	Columbus	79	12	3	100
East High School	Lincoln	78	09	6	80
Elwood Public	Elwood	80	01	2	26
Emerson-Hubbard Public	Emerson	79	09	2	83
Goodrich Junior High	Lincoln	79	09	4	120
Hebron High School	Hebron	80	02	1	45
Hershey High School	Hershey	80	01	2	120
Holy Family High	Lindsay	80	06	2	50
Hordville Public	Hordville	79	03	3	15
Irving Junior High	Lincoln	79	09	3	375
Irving Junior High	Lincoln	79	10	2	260
Medicine Valley High	Curtis	79	01	8	60
Millard Level II	Omaha	81	01	2	100
Nebraska City High	Nebraska City	80	01	1	60

Nebraska Lutheran	Waco	80	04	6	24
Norfolk Junior High	Norfolk	81	01	1	130
Odell Public	Odell	80	03	3	50
Schuyler Central High	Schuyler	78	02	6	650
Seward Junior High	Seward	79	09	4	250
Trumball Consolidated	Trumball	80	02	4	60
Valley View Junior High	Omaha	79	03	1	205
Wilcox High School	Wilcox	81	01	1	10
Winnebago Public	Winnebago	80	03	3	73
Wisner-Pilger Public	Wisner	79	09	3	36
Totals				92	3,252

- -

Table 19

Projected Statewide Student Impact (BTU)

Number of mailings = 1,050

Number of responses = 336

Response rate = $\frac{336}{1050}$ x 100% = 32.0%

Proportional Statewide Student Impact: $\frac{3252}{32.0\%} = \frac{x}{100\%}$

Impact = x = 10,163 students

- -

The total of 10,163 students may be substantially greater than the actual number of students affected, because the proportion assumes that equal numbers of non-users and users failed to respond to the study. It can be assumed, however, that more teachers would respond if familiarity with the BTU project exists. Therefore, the proportion is positively biased and the number of students having received instruction using the BTU project is actually lower than 10,163. Yet, while the number of school districts and students having used BTU may be lower than anticipated, this population data is effective in judging the relative merit of the BTU project. Table 20 depicts qualitative BTU project data.

Table 20

BTU Qualitative Data

Question	$\bar{X}$	n
D. Material Applicability within Curriculum	3.96	30
E. Student Interest in Material	3.80	30
F. Content Applicability to Student Background	3.66	30
G. Content Relevancy	4.00	30
H. Geographic Relevancy	3.93	30
I. Validity of Learning Activities	3.96	29
J. Impact on Student Awareness and Understanding	4.06	30
	3.91	209

The means ($\bar{X}$) depicted in Table 20, were calculated by tabulating teacher responses to a five-point Likert scale and dividing by the total number of respondents. The most positive response was equal to 5 and the most negative equal to 1. General satisfaction was determined to be any mean greater than 3.5. Using this criterion, it appears that teacher users consider the content, validity and relevancy of the BTU project to be successful. This data is, however, more difficult to analyze than data for the ECAP project, because the BTU project contains a wide variety of instructional units spread across a diverse teacher population. To determine the relative merit of the entire package is nearly impossible, but, for revision purposes, an analysis of the usefulness of specific individual instructional units was considered of paramount importance. Only by completing individual analyses could the NEO determine the merit of the BTU project and decide which units warrant revision. Individual unit analyses are depicted in Tables 21-22. (A descriptive list of analyzed BTU units can be found in the Appendices.)

Table 21

Usefulness of BTU Units

	Unit No. and Title	Used (n)	Useful (n)	Disliked (n)
1.	Fueling Around Could be Hazardous to Your Health	10	4	1
2.	Physical Laws of Electrical Power Generation	8	6	2
3.	Energy Conservation in the Home	14	9	2
4.	Oil: Fuel of the Past	13	5	3
5.	Energy: Yesterday, Today, and Tomorrow	16	10	3
6.	Solar Energy in the Home	16	11	1
7.	Gasohol	11	9	1
8.	Conservation with the "Double Nickel" and Carpooling	3	0	3
9.	Economics and Energy	4	0	2
10.	Future Energy Technologies	7	3	1
11.	NO ENERGY!	5	2	1
12.	Energy Uses in Nebraska Agriculture	4	2	2
13.	Am I the Way?	2	1	2
14.	Energy in an Age of Scarcity	3	1	1
15.	National Energy Policy	3	0	2
16.	Energy From the Atom	6	1	1
17.	Energy and Economics for Junior High Students	4	3	1
18.	Energy Flow Through a Food Chain	4	1	1
19.	Coal: Fuel of the Past, Hope of the Future	9	5	1
20.	Energy Conservation in the School Building	1	0	1
21.	The History of U.S. Energy Usage	7	2	0
22.	Automotive Energy Efficiency	4	1	1

A scoring system was devised, utilizing the results of Table 21, to better reflect the relative quality of each individual unit. The results of the scoring treatment were employed to determine the revision work anticipated for the BTU project. These results are presented in Table 22.

Table 22

Individual BTU Ratings*

Units were scored, for comparison purposes, by the following method:

Unit Score = (Used n + Useful n) - Disliked n

Thus, if 10 respondents used a particular unit, 8 of which found it useful and 1 disliked it, the unit score = (10 + 8) -1 = 17. Using the responses from Table 21, BTU Ratings were:

Unit No. and Title		Rating
6.	Solar Energy in the Home	26
5.	Energy: Yesterday, Today and Tomorrow	23
3.	Energy Conservation in the Home	21
7.	Gasohol	19
4.	Oil: Fuel of the Past	15
19.	COAL: Fuel of the Past, Hope of the Future	13
1.	Fueling Around Could be Hazardous to Your Health	13
2.	Physical Laws of Electrical Power Generation	12
21.	The History of U.S. Energy Usage	9
10.	Future Energy Technologies	9
16.	Energy From the Atom	6
17.	Energy and Economics for Junior High School Students	6
11.	NO ENERGY!	6
18.	Energy Flow Through A Food Chain	4
22.	Automotive Energy Efficiency	4
12.	Energy Uses in Nebraska Agriculture	4
14.	Energy in the Age of Scarcity	3
9.	Economics and Energy	2
13.	Am I The Way?	2
8.	Conservation with the "Double Nickel"	0
20.	Energy Conservation in the School Building	0

- -

*The rating scores show a wide degree of usefulness and quality for individual units. Because the original 14 units were developed one year prior to the 8 units contained within Volume II, the NEO considered similar ratings for the latter 8 to be an indication of higher quality and usefulness compared with the former 14. (Note Unit numbers 19, 21, and 16.) The final 8 units developed for Volume III are note rated, since they were disseminated after the evaluation was performed.

The wide range of rating scores indicated a need for revision of the BTU project, concentrating on the most popular and useful of the individual units. Rather than continue to

offer all 30 units as a single package, the NEO determined to revise, edit and typeset the 10-12 highest quality units and continue to offer the other units in their present format. All units would thus, upon revision completion, be offered individually. Other factors, contributing to the conclusion that the BTU project has been successful, can be found in Tables 23-24. Additional factors, supporting the need for direct in-service and promotion, can be found in Tables 25-26.

- -

Table 23

BTU Reading Level

Response	n	%
Appropriate	29	93.5
Too High	2	6.5
Too Low	0	0.0

- -

Table 24

BTU Technical Level

Response	n	%
Appropriate	28	90.3
Too High	3	9.7
Too Low	0	0.0

- -

Table 25

Necessity for BTU In-Service

Response	n	%
Yes	27	84.4
No	5	15.6

Table 26

Factors Hindering the Use of BTU

Response	n	%
None	15	46.9
Too much time required	5	15.6
Space required	1	3.1
Equipment required	4	12.5
Doesn't fit curriculum	3	9.4
No Administrative support	4	12.5

BTU Project Summary

1. 54% of all Nebraska secondary teachers responding to this study cover energy topics in their daily instruction. They average three sessions per academic year.

2. 17% of this same teacher population reported that their school district possessed a complete set of Basic Teaching Units on Energy.

3. The BTU project accounts for 100% of all reported formal energy education curriculum use.

4. The BTU program represents an 8.9% share of total statewide coverage.

5. A positively biased estimate of 10,163 students have received instruction by the BTU project.

6. The two major reasons for the low extent of statewide use for the BTU project appear to be: little administrative support and too little time available in the total curriculum for implementation of the project.

7. Teachers reporting use of the BTU project appear to be generally satisfied with the content, relevance, and validity of 30% of the individual units. A wide range of quality ratings exists between units on a comparative basis.

8. The BTU project will be more successful on an individual unit basis as opposed to a collective bulk package. These individual units should be promoted statewide through a direct in-service program.

CONCLUSIONS

In the Preface of this document, the time was taken to describe the idealistic goals of a comprehensive program in energy education. The question, related to those goals, was posed "Can the schools deliver so lofty a promise?" For teacher users of a formal curriculum program in energy education, the answer to that question was positive. It is unfortunate, however, that so few teachers see a need to implement a formal program. The results of this study indicate a need for:

1. Increased awareness of the existence of energy education curricula;

2. Greater administrative support for implementing a comprehensive program; and

3. Direct in-service programs to familizarize school staff members and administrative faculty with formal curriculum use and infusion.

The forementioned conclusions were based solely on the responses from teacher users. As noted in the Preface, however, a successful study evaluating the goals of energy education should include information from the ultimate product of energy education; the students themselves and the attitudes of both students and their teachers toward energy use and conservation. An adjunct study, conducted for the purpose of determining this information, showed that:

1. Based on surveys of secondary science and social studies students in Nebraska during 1979 and 1981, there appears to have been little change in students' overall energy attitudes;

2. There is no significant relationship between teacher energy attitudes and their students' energy attitudes;

3. Teacher energy attitudes seem to be related directly to the teacher's stages of concern about energy education as an innovation;

4. Teachers at all stages of concern about energy education appear equally prone to request energy curriculum materials from the Nebraska Energy Office; and

5. Providing teachers with knowledge of their own students' energy attitudes and behaviors increases the teacher's "search behavior" for curricular alternatives.

If Nebraska is to continue to serve as a national "model" effort in energy education, then we need to STOP the development of more and more materials. We need to reduce our volume and concentrate on a tight, high quality, formal educational program. Volumes of materials, brochures, pamphlets, brochures, etc. DO NOT imply a successful program. Volume simply implies volume! Quality, consistency, and sincerity sell themselves.

RECOMMENDATIONS

A concerted effort and commitment to energy education should be able to evoke a substantial change in attitude toward the useless waste of precious energy resources if the Nebraska Energy Office and related organizations will continue efforts to perform the following functions:

1. SUPPORT CHANGE ...

   Sheer distribution of energy curriculum materials to school district personnel will NOT cause implementation to "HAPPEN". Time and effort must be devoted to promotion and "after care" of Energy Conservation Activity Packets, Basic Teaching Units on Energy, and all related energy education projects and materials.

2. PLAN CHANGE ...

   Teachers and administrators have different stages of concern regarding energy education. Plans must be made to meet the needs of each concern stage. As teachers gain experience with energy education materials, they may be expected to move progressively to higher stages of concern and competence.

3. MONITOR CHANGE ...

   Many teachers require data to convince them of the necessity of energy education. Once a program, such as the ECAP or BTU project, has been implemented, teachers need to know that their efforts are making a difference. An instrument, such as the Youth Energy Survey or NEO evaluation form, can serve as both an instigator and perpetuator. As an instigator, survey results can initiate "search behavior" for the ECAP and BTU projects as curricular alternatives. As a perpetuator, survey results provide a measure of teacher satisfaction and student energy attitude change.

4. ENCOURAGE CHANGE ...

   Teachers must be convinced that there are options to the "classic" or "in situ" curriculum. Beneath the guise of novelty or fad, energy education offers an avenue to the basics. That fact must be encouraged through emphasis, demonstration, and in-service.

5. BUILD DISSEMINATING NETWORKS

The Educational Service Units can represent a viable and visible force in promoting and distributing ECAP and BTU project materials. Individual contacts need to be established, kept current, and trained in the use and availability of both the ECAP and BTU projects. A major problem for the NEO has been the lack of reinforcing statewide visibility. A trained individual at every ESU could both alleviate the workload of the NEO Education Coordinator as well as provide more direct contact in-service to the school districts they serve.

6. PROMOTE QUALITY ...

The products of energy education exist in the multitude of materials available through commercial, governmental, public, and private agencies. Emphasis now needs to be placed on the process of implementing these materials. Quantity MUST take a back seat to QUALITY. Use and experience will produce that quality.

APPENDICES

Contents

A - Survey Instruments and Cover Letters

B - Non-Analyzed ECAP Project Data

C - Non-Analyzed BTU Project Data

D - List of Educational Service Units

E - Dissemination Methodology/Samples

F - Energy Conservation Activity Packet Pilot Schools

G - Adjunct Study Materials

APPENDIX A

SURVEY INSTRUMENTS AND COVER LETTERS

CHARLES THONE
GOVERNOR

State of Nebraska
Nebraska Energy Office
Box 95085
Lincoln, Nebraska 68509
(402) 471-2867

WILLIAM H. PALMER
DIRECTOR

January, 1981

Dear Elementary Educator:

WE NEED YOUR HELP!

The Nebraska Energy Office is in the process of evaluating our K-6 energy education curriculum program entitled Energy Conservation Activity Packets.

The responses you provide will determine the following information:

a) extent of statewide use;
b) effectiveness of the program;
c) quality of the program;
d) revision work required; and
e) how to improve our statewide services.

The enclosed survey is NOT intended solely for those schools presently using our materials. In fact, it doesn't matter if you've NEVER heard about them! It does matter, however, that you take the time to complete our evaluation instrument (or assign the task to the most appropriate individual).

Participation in this evaluative process represents an opportunity for you, your school, and community to have a voice in determining the future direction of energy education in the State of Nebraska.

Directions

- If you have never seen, heard about, nor used our materials, please complete PAGE ONE of the survey and return it in the provided envelope. (NOTE: A brief description of our energy education programs is included on the last page of the survey.)

- If you have used our materials, please complete all appropriate sections and return in the provided envelope.

Thank you for your cooperation!

Sincerely,

Larry Scharmann

Larry Scharmann
Education Coordinator

Enc.

NEBRASKA ENERGY OFFICE
ENERGY EDUCATION
K-6 CURRICULUM EVALUATION

1. Name of School _____ 2. Location _____

3. Respondent's Name _____

4. Respondent's Position (Check the appropriate space):

   ___ a. elementary teacher ___ c. other (specify): _____

   ___ b. curriculum coordinator _____

5. What grade level(s) do you teach? (Circle the appropriate grades)

   K 1 2 3 4 5 6

6. What subject(s) do you teach? (Check the appropriate spaces.)

   ___ a. all (elementary) ___ e. other (specify): _____

   ___ b. science _____

   ___ c. mathematics

   ___ d. social studies

7. During the past school year (fall 1979 - fall 1980) did you make energy presentations to any of your classes? DO NOT INCLUDE SCHOOLWIDE ASSEMBLY PROGRAMS.

   _____ Yes _____ No

8. If your answer to (7) was yes, approximately how many different class sessions did you spend on energy during that time span? (Circle one)

   Less than one 1 2 3-5 6-10 over 10

9. Have you (or your school) ordered or received any of the energy education curriculum materials listed below? (Check, if YES)

	ELEMENTARY PROGRAM TITLE	SOURCE OF MATERIAL
_____	Energy Conservation Activity Packets	Nebraska Energy Office
_____	Science Activities in Energy	U.S. Dept. of Energy (DOE)
_____	Proj. for an Energy Enriched Curr.	Natl. Sci. Tchrs. Assoc./Doe
_____	Energy and Man's Environment	Energy and Man's Environment

10. Have you used the materials at all in your classes?

    _____ Yes (Go on to ITEM 12) _____ No (Go on to ITEM 11)

11. If you have not used the materials, why not? (Check all that apply)

    ___ a. Limited class time available

    ___ b. Doubt usefulness of material

    ___ c. Doubt relevance to students

    ___ d. Had no time to evaluate the materials

    ___ e. Decided to use energy education materials from another source

    ___ f. Feel energy education should not be a part of the curriculum

    ___ g. Other (specify): _____

    _____

(STOP HERE. PLEASE RETURN THIS FORM IN THE ENVELOPE PROVIDED)

12. Consistent with your response to item (9), please complete the sections indicated below:

    ELEMENTARY PROGRAM TITLE

    Section I — Energy Conservation Activity Packets
    Section II — Science Activities in Energy
    Section III — Project for an Energy Enriched Curriculum
    Section IV — Energy and Man's Environment

Note: After you have completed all appropriate sections please retrun this form in the provided envelope. Thank you very much for your cooperation.

Section I

ENERGY CONSERVATION ACTIVITY PACKETS
(Nebraska Energy Office, Grades K-6)

A. Approximately when did you begin using the materials?

Month _____ Year _____

B. To date, how many times have you used the materials? _____

C. To date, how many students have been exposed to the materials? Give the approximate total since you began using the materials.

_____

Directions: For items D-J, circle the number that best depicts your opinion of the Energy Conservation Activity Packets (relative to each item).

D. To what extent does the material fit into the units of subject matter you are teaching?

Not At All 1 2 3 4 5 Very Well

E. To what extent do your students find the materials interesting?

Not At All 1 2 3 4 5 Very Interesting

F. To what extent is the content of the material related to your students' experience and background?

Not At All 1 2 3 4 5 Very Much Related

G. To what extent is the content of the material relevant to your students' information needs?

Not At All 1 2 3 4 5 Very Relevant

H. To what extent are the topics covered in the material relevant to your geographic region?

Not At All 1 2 3 4 5 Very Relevant

I. To what extent do students achieve the learning objectives as stated in the packets?

Not At All 1 2 3 4 5 Most Students Achieve Them

J. To what extent have the materials had an impact on your students' awareness and understanding of the energy situation in the U.S.?

No Impact 1 2 3 4 5 Appreciable Impact

K. Is the reading level appropriate for your students?

___ Yes ___ No, too high ___ No, too low

L. Is the material at the appropriate technical level for your students?

___ Yes ___ No, too technical ___No, not technical enough

M. Where did you learn of the Energy Conservation Activity Packets? (Check all that apply.)

___1. Teacher's Conventions
___2. NSEA newsletters
___3. State Dept. of Education
___4. Other teachers
___5. School supervisor, coordinator, principal, librarian, etc.
___6. Other (specify): _____

_____

N. Apart from your own self-study of the materials, do you feel that special or additional training is necessary for the material to be used effectively by an instructor?

___Yes ___No

O. In your judgment, do any factors hinder the use of the materials? (Check all that apply)

___No
___Yes, time required
___Yes, space required
___Yes, materials/equipment required
___Yes, does not fit into existing curriculum
___Yes, other (specify):

_____

P. For your grade level(s), what additional packets should be developed or what additional topics covered to teach energy concepts to your students?

_____

_____

Q. For your grade level(s), should any media be added to existing materials to more effectively teach energy concepts? (Check all that apply.)

___ No
___ Yes, graphics
___ Yes, film strips
___ Yes, audio cassettes
___ Yes, videotapes
___ Yes, other (specify): _____

_____

R. For your grade level(s), should any prescribed learning activities be added to more effectively teach energy concepts? (Check all that apply)

___ None
___ Field trips
___ Guest speakers
___ In-home activities
___ Student group discussions/ activities
___ Individual projects
___ Other (specify: _____)

S. In your opinion, what are the major strengths and weaknesses of the Energy Conservation Activity Packets?

Strengths:

Weaknesses:

T. As of August 8, 1980, the Energy Conservation Activity Packets were no longer provided free of charge. In your opinion, how likely would your school be to purchase these materials if each packet costs $4.00 and the entire K-6 package costs $20.00.

___ Not at all
___ Probably
___ Definitely
___ Don't know

U. Are there additional services or information you would like concerning energy conservation education?

___ Yes ___ No (If yes, please briefly describe below.)

V. Please list any comments or suggestions you might have for teachers considering teaching about energy conservation.

Section II

SCIENCE ACTIVITIES IN ENERGY
(U.S. Dept. of Energy, Oak Ridge Labs, Grades 4-8)

A. In your opinion, what are the strengths and weaknesses of Science Activities in Energy?

Strengths:

_____

_____

_____

Weaknesses:

_____

_____

_____

B. As an instructional package, compared to the Nebraska Energy Office's Energy Conservation Activity Packets, I find Science Activities in Energy to be:

___ Far Superior
___ Somewhat Superior
___ About Equal
___ Somewhat Inferior
___ Far Inferior
___ Can't compare, have not used NEO's Energy Conservation Activity Packets.

C. Briefly, explain your answer to (B):

_____

_____

_____

Section III
PROJECT FOR AN ENERGY ENRICHED CURRICULUM
(National Science Teachers Association/DOE, K-6)

A. In your opinion, what are the strengths and weaknesses of the Project for an Energy Enriched Curriculum?

Strengths:

_____

_____

_____

Weaknesses:

_____

_____

_____

B. As an instructional package, compared to the Nebraska Energy Office's Energy Conservation Activity Packets, I find the Project for an Energy Enriched Curriculum to be:

___ Far Superior
___ Somewhat Superior
___ About Equal
___ Somewhat Inferior
___ Far Inferior
___ Can't compare, have not used NEO's Energy Conservation Activity Packets.

C. Briefly, explain your answer to (B):

_____

_____

_____

Section IV

ENERGY AND MAN'S ENVIRONMENT
(Grades 1-3, 4-6)

A. In your opinion, what are the strengths and weaknesses of Energy and Man's Environment?

Strengths: _____

_____

_____

Weaknesses: _____

_____

_____

B. As an instructional package, compared to the Nebraska Energy Office's Energy Conservation Activity Packets, I find Energy and Man's Environment to be:

___ Far Superior
___ Somewhat Superior
___ About Equal
___ Somewhat Inferior
___ Far Inferior
___ Can't compare, have not used NEO's Energy Conservation Activity Packets.

C. Briefly, explain your answer to (B): _____

_____

_____

NEBRASKA ENERGY OFFICE
ENERGY EDUCATION PROJECTS

K-12 Curriculum projects available from the NEO are briefly described in the following paragraphs:

1. **The Energy Conservation Activity Packets,** developed in Iowa and revised for Nebraska use, were field tested in 38 elementary school districts in Nebraska during the 1978-79 academic year. The program was revised during the summer of 1979 and made available during the 1978-79 academic year. The complete K-6 package costs $20.00. Individual grade-level packets each cost $4.00.

2. **The Basic Teaching Units on Energy (BTUs),** were developed at a summer institute in 1978 jointly sponsored by the NEO, UNL, and DOE. The series of fourteen mini-units were field tested in 50 secondary school districts across the State during the 1978-79 academic year. The project was expanded to 22 units in 1979. The complete 22 unit package can be purchased for $20.00.

3. **Energy Resources Directory:** For this project, the NEO divided the State into five regions to produce a product that would provide teachers and other interested individuals with local sources of energy information materials. The Directory has been referenced by fuel type, and includes print, nonprint, speaker, and tour information for energy in Nebraska. The Directory is a supplement to all other NEO energy education programs.

4. **Driver Education State-Specific Handbook:** An energy efficiency Driver Education handbook for Nebraska high schools was distributed for use during the 1979-80 academic year. Adult use will follow after high school implementation and evaluation is completed. This is a joint venture by the NEO and the Nebraska Driver Education Association.

5. **School Bus Drivers Energy Efficiency Handbook:** This handbook is essentially a training manual to aid school districts save transportation costs and fuel through driver efficiency techniques. This project is co-sponsored by the NEO and Field Services Division of the Nebraska State Department of Education.

All inquiries regarding these projects should be addressed to:

Nebraska Energy Office
P.O. Box 95085
Lincoln, Nebraska 68509
(402) 471-2867

Gary A. Lay
Energy Programs Manager

Larry Scharmann
Education Coordinator

445E

CHARLES THONE
GOVERNOR

State of Nebraska
Nebraska Energy Office
Box 95085
Lincoln, Nebraska 68509
(402) 471-2867

WILLIAM H. PALMER
DIRECTOR

January, 1981

Dear Science Teacher:

WE NEED YOUR HELP!

The Nebraska Energy Office is in the process of evaluating our 7-12 energy education curriculum program entitled Basic Teaching Units on Energy.

The responses you provide will determine the following information:

a) extent of statewide use;
b) effectiveness of the program;
c) quality of the program;
d) revision work required; and
e) how to improve our statewide services.

The enclosed survey is NOT intended solely for those schools presently using our materials. In fact, it doesn't matter if you've NEVER heard about them! It does matter, however, that you take the time to complete our evaluation instrument (or assign the task to the most appropriate individual).

Participation in this evaluative process represents an opportunity for you, your school, and community to have a voice in determining the future direction of energy education in the State of Nebraska.

Directions

- If you have never seen, heard about, nor used our materials, please complete PAGE ONE of the survey and return it in the provided envelope. (NOTE: A brief description of our energy education programs is included on the last page of the survey.)

- If you have used our materials, please complete all appropriate sections and return in the provided envelope.

Thank you for your cooperation!

Sincerely,

Larry Scharmann

Larry Scharmann
Education Coordinator

Enc.

CHARLES THONE
GOVERNOR

State of Nebraska
Nebraska Energy Office
Box 95085
Lincoln, Nebraska 68509
(402) 471-2867

WILLIAM H. PALMER
DIRECTOR

January, 1981

Dear Social Science Teacher:

WE NEED YOUR HELP!

The Nebraska Energy Office is in the process of evaluating our 7-12 energy education curriculum program entitled Basic Teaching Units on Energy.

The responses you provide will determine the following information:

a) extent of statewide use;
b) effectiveness of the program;
c) quality of the program;
d) revision work required; and
e) how to improve our statewide services.

The enclosed survey is NOT intended solely for those schools presently using our materials. In fact, it doesn't matter if you've NEVER heard about them! It does matter, however, that you take the time to complete our evaluation instrument (or assign the task to the most appropriate individual).

Participation in this evaluative process represents an opportunity for you, your school, and community to have a voice in determining the future direction of energy education in the State of Nebraska.

Directions

- If you have never seen, heard about, nor used our materials, please complete PAGE ONE of the survey and return it in the provided envelope. (NOTE: A brief description of our energy education programs is included on the last page of the survey.)

- If you have used our materials, please complete all appropriate sections and return in the provided envelope.

Thank you for your cooperation!

Sincerely,

Larry Scharmann

Larry Scharmann
Education Coordinator

Enc.

NEBRASKA ENERGY OFFICE

ENERGY EDUCATION
7-12 CURRICULUM EVALUATION

1. Name of School _____ 2. Location _____

3. Respondent's Name _____

4. Respondent's Position (Check the appropriate space):

___ a. high school teacher ___ c. curriculum coordinator

___ b. junior high school teacher ___ d. other (specify): _____

5. What grade level(s) do you teach? (Circle the appropriate grades)

7 8 9 10 11 12

6. What subject(s) do you teach? (Check the appropriate spaces.)

___ a. science ___ e. other (specify): _____

___ b. social studies _____

___ c. mathematics

___ d. industrial arts

7. During the past school year (fall 1979 - fall 1980) did you make energy presentations to any of your classes? DO NOT INCLUDE SCHOOLWIDE ASSEMBLY PROGRAMS.

_____ Yes _____ No

8. If your answer to (7) was yes, approximately how many different class sessions did you spend on energy during that time span? (Circle one)

Less than one 1 2 3-5 6-10 over 10

9. Have you (or your school) ordered or received any of the energy education curriculum materials listed below? (Check, if YES)

SECONDARY PROGRAM TITLE	SOURCE OF MATERIAL
_____ Basic Teaching Units on Energy	Nebraska Energy Office
_____ Proj. for an Energy Enriched Curr.	U.S. Dept. of Energy (DOE)
_____ Energy and Man's Environment	Energy and Man's Environment

10. Have you used the materials at all in your classes?

_____ Yes (Go on to ITEM 12) _____ No (Go on to ITEM 11)

11. If you have not used the materials, why not? (Check all that apply)

___ a. Limited class time available ___ f. Feel energy education should not be a part of the curriculum

___ b. Doubt usefulness of material

___ c. Doubt relevance to students ___ g. Other (specify): _____

___ d. Had no time to evaluate the materials _____

___ e. Decided to use energy education materials from another source

(STOP HERE. PLEASE RETURN THIS FORM IN THE ENVELOPE PROVIDED)

12. Consistent with your response to item (9), please complete the sections indicated below:

SECONDARY PROGRAM TITLE
Section I — Basic Teaching Units on Energy
Section II — Project for an Energy Enriched Curriculum
Section III — Energy and Man's Environment

Note: After you have completed all appropriate sections please return this form in the provided envelope. Thank you very much for your cooperation.

Section I

BASIC TEACHING UNITS ON ENERGY
(Nebraska Energy Office, Grades 7-12)

A. Approximately when did you begin using the materials?

Month _____ Year _____

B. To date, how many times have you used the materials? _____

C. To date, how many students have been exposed to the materials? Give the approximate total since you began using the materials.

_____

Directions: For items D-J, circle the number that best depicts your opinion of the Basic Teaching Units on Energy (relative to each item).

D. To what extent does the material fit into the units of subject matter you are teaching?

Not At All 1 2 3 4 5 Very Well

E. To what extent do your students find the materials interesting?

Not At All 1 2 3 4 5 Very Interesting

F. To what extent is the content of the material related to your students' experience and background?

Not At All 1 2 3 4 5 Very Much Related

G. To what extent is the content of the material relevant to your students' information needs?

Not At All 1 2 3 4 5 Very Relevant

H. To what extent are the topics covered in the material relevant to your geographic region?

Not At All 1 2 3 4 5 Very Relevant

I. To what extent do students achieve the learning objectives as stated in the packets?

Not At All 1 2 3 4 5 Most Students Achieve Them

J. To what extent have the materials had an impact on your students' awareness and understanding of the energy situation in the U.S.?

No Impact 1 2 3 4 5 Appreciable Impact

K. Directions: For the following three items, refer to the list of Basic Teaching Units on the next page (numbers and titles). Circle the numbers that correspond to the unit titles.

1. What units have you used?

1 2 3 4 5 6 7 8 9 10 11 12

13 14 15 16 17 18 19 20 21 22

2. What units do you find particularly useful?

1 2 3 4 5 6 7 8 9 10 11 12

13 14 15 16 17 18 19 20 21 22

Why are they useful?

_____

_____

_____

3. What units have you disliked?

1 2 3 4 5 6 7 8 9 10 11 12

13 14 15 16 17 18 19 20 21 22

Why do you dislike them?

_____

_____

_____

L. Is the reading level appropriate for your students?

___ Yes ___ No, too high ___ No, too low

M. Is the material at the appropriate technical level for your students?

___ Yes ___ No, too technical ___No, not technical enough

N. Where did you learn of Basic Teaching Units on Energy? (Check all that apply.)

___1. Teacher's Conventions
___2. NSEA newsletters
___3. State Dept. of Education
___4. Other teachers
___5. School supervisor, coordinator, principal, librarian, etc.
___6. Other (specify): _____

_____

Basic Teaching Units on Energy

Unit Number	Unit Title
1	Fueling Around Could Be Hazardous to Your Health.
2	Physical Laws of Electrical Power Generation.
3	Energy Conservation in the Home.
4	Oil: Fuel of the Past.
5	Yesterday, Today, and Tomorrow.
6	Solar Energy in the Home.
7	Gasohol.
8	Conservation with the "Double Nickel" and Carpooling
9	Economics and Energy
10	Future Energy Technologies.
11	No Energy.
12	Energy Uses in Nebraska Agriculture.
13	Am I the Way.
14	Energy in the Age of Scarcity.
15	National Energy Policy.
16	Energy from the Atom.
17	Energy and Economics for Junior High School Students.
18	Energy Flow through a Food Chain.
19	COAL: Fuel of the Past, Hope of the Future.
20	Energy Conservation in the School Building.
21	The History of U.S. Energy Usage.
22	Automotive Energy Efficiency.

O. Apart from your own self-study of the materials, do you feel that special or additional training is necessary for the material to be used effectively by an instructor

___Yes ___No

P. In your judgment, do any factors hinder the use of the materials? (Check all that apply)

___No
___Yes, time required
___Yes, space required
___Yes, materials/equipment required
___Yes, does not fit into existing curriculum
___Yes, other (specify):

_____

Q. For your subject area(s) taught, what additional units should be developed or what additional topics covered to teach energy concepts more effectively?

_____

_____

R. For your subject area(s), should any media be added to existing materials? (Check all that apply.)

___ No
___ Yes, graphics Unit numbers: _____
___ Yes, film strips Unit numbers: _____
___ Yes, audio cassettes Unit numbers: _____
___ Yes, videotapes Unit numbers: _____
___ Yes, other (specify): _____

S. In your opinion, what are the major strengths and weaknesses of the Basic Teaching Units On Energy?

Strengths:

_____

_____

_____

Weaknesses:

_____

_____

_____

T. As of August 8, 1980, the Basic Teaching Units on Energy were no longer provided free of charge. In your opinion, how likely would your school be to purchase these materials at a cost of $20.00/complete set?

___ Not at all
___ Probably
___ Definitely
___ Don't know

U. Are there additional services or information you would like concerning energy conservation education?

___ Yes ___ No (If yes, please briefly describe below.)

_____

_____

_____

V. Please list any comments or suggestions you might have for teachers considering teaching about energy conservation.

_____

_____

_____

Section II

PROJECT FOR AN ENERGY ENRICHED CURRICULUM
(National Science Teachers Association/DOE, 7-12)

A. In your opinion, what are the strengths and weaknesses of the Project for an Energy Enriched Curriculum?

Strengths:

_____

_____

_____

Weaknesses:

_____

_____

_____

B. As an instructional package, compared to the Nebraska Energy Office's Basic Teaching Units on Energy, I find the Project for an Energy Enriched Curriculum to be:

___ Far Superior
___ Somewhat Superior
___ About Equal
___ Somewhat Inferior
___ Far Inferior
___ Can't compare, have not used NEO's Basic Teaching Units on Energy

C. Briefly, explain your answer to (B):

_____

_____

_____

Section III

ENERGY AND MAN'S ENVIRONMENT
(Grades 7-9, 10-12)

A. In your opinion, what are the strengths and weaknesses of Energy and Man's Environment?

Strengths: _____

_____

_____

Weaknesses: _____

_____

_____

B. As an instructional package, compared to the Nebraska Energy Office's Basic Teaching Units on Energy, I find Energy and Man's Environment to be:

___ Far Superior
___ Somewhat Superior
___ About Equal
___ Somewhat Inferior
___ Far Inferior
___ Can't compare, have not used NEO's Basic Teaching Unit on Energy

C. Briefly, explain your answer to (B): _____

_____

_____

(Please return this form in the envelope provided.)

NEBRASKA ENERGY OFFICE
ENERGY EDUCATION PROJECTS

K-12 Curriculum projects available from the NEO are briefly described in the following paragraphs:

1. **The Energy Conservation Activity Packets,** developed in Iowa and revised for Nebraska use, were field tested in 38 elementary school districts in Nebraska during the 1978-79 academic year. The program was revised during the summer of 1979 and made available during the 1978-79 academic year. The complete K-6 package costs $20.00. Individual grade-level packets each cost $4.00.

2. **The Basic Teaching Units on Energy (BTUs),** were developed at a summer institute in 1978 jointly sponsored by the NEO, UNL, and DOE. The series of fourteen mini-units were field tested in 50 secondary school districts across the State during the 1978-79 academic year. The project was expanded to 22 units in 1979. The complete 22 unit package can be purchased for $20.00.

3. **Energy Resources Directory:** For this project, the NEO divided the State into five regions to produce a product that would provide teachers and other interested individuals with local sources of energy information materials. The Directory has been referenced by fuel type, and includes print, nonprint, speaker, and tour information for energy in Nebraska. The Directory is a supplement to all other NEO energy education programs.

4. **Driver Education State-Specific Handbook:** An energy efficiency Driver Education handbook for Nebraska high schools was distributed for use during the 1979-80 academic year. Adult use will follow after high school implementation and evaluation is completed. This is a joint venture by the NEO and the Nebraska Driver Education Association.

5. **School Bus Drivers Energy Efficiency Handbook:** This handbook is essentially a training manual to aid school districts save transportation costs and fuel through driver efficiency techniques. This project is co-sponsored by the NEO and Field Services Division of the Nebraska State Department of Education.

All inquiries regarding these projects should be addressed to:

Nebraska Energy Office
P.O. Box 95085
Lincoln, Nebraska 68509
(402) 471-2867

Gary A. Lay
Energy Programs Manager

Larry Scharmann
Education Coordinator

445E

APPENDIX B

Non-Analyzed ECAP Project Data

Table 27

Primary Contact With ECAP

Response	n = 20	%
Teacher's Conventions	1	5.0
Nebraska State Education Association News	1	5.0
State Department of Education	7	35.0
Other Teachers	2	10.0
At my School	4	20.0
Nebraska Energy Office	9	45.0

Table 28

Elementary Respondents by Class Size

Response	n=163	%
Class 1	24	14.7
Class 2	6	3.7
Class 3	95	58.3
Class 4	6	3.7
Class 5	32	19.6
Class 6	0	0.0

Table 29

Classification of Nebraska School Districts[11]

Class 1 Districts maintaining only the elementary grades from kindergarten through the 8th grade.

Class 2 Districts under 1,000 population, maintaining both elementary and high school education.

Class 3 Districts of 1,000 to 50,000 population, maintaining both elementary and high school education.

Class 4 (Lincoln only) Districts of 50,000 to 200,000 population, maintaining both elementary and high school education.

Class 5 (Omaha only) Districts of 200,000 or more population, maintaining both elementary and high school education.

Class 6 Districts which are organized to maintain high school education only.

Table 30

Elementary Respondents by Position

Response	n	%
Elementary Teacher	69	42.3
Curriculum Coordinator	15	9.2
Administrator	81	49.7

Table 31

Elementary Respondents by Grade Taught

Response	n	%
Kindergarten-2nd Grade	38	23.3
3rd Grade	37	22.7
4th Grade	43	26.4
5th Grade	68	41.7
6th Grade	80	49.1

Table 32

Elementary Respondents by Subject Taught

Response	n	%
All Elementary Subjects	73	44.8
Science	35	21.5
Mathematics	20	12.3
Social Studies	10	6.1
Other	45	27.6

Table 33

Willingness to Pay for the ECAP Project

Response	n=20	%
No	5	25.0
Probably	3	15.0
Definitely (Yes)	2	10.0
Unsure	11	55.0

- -

Table 34

Are Additional ECAP Necessary?

Response	n	%
Yes	7	58.3
No	5	41.6

Packet Title Suggestions	n
A. The Energy Challenge	1
B. Solar and Wind	1
C. Oil/Coal/Wood	1
D. Conservation	4

- -

Table 35

Suggested ECAP Media Development

Response	n=20	%
Graphics	4	20.0
Filmstrips	5	25.0
Videotapes	7	35.0
Audio Cassettes	15	75.0
Television Programming	6	30.0

Table 36

Suggested ECAP Activity Development

Response	n=20	%
Keep program intact	3	15.0
Field Trips	4	20.0
Guest Speakers	8	40.0
Additional homework	11	55.0
Group discussion	5	25.0
Independent Projects	3	15.0
Other	6	30.0

APPENDIX C

Non-Analyzed BTU Project Data

Table 37

Primary Contact with BTU

Response	n=30	%
Teacher's Conventions	3	10.0
NE State Education Association News	5	16.7
State Department of Education	9	30.0
Other Teachers	6	20.0
At My School	2	6.7
Nebraska Energy Office	14	46.7

- -

Table 37

Secondary Respondents by Class Size

Response	n=336	%
Class 1	0	0.0
Class 2	73	21.7
Class 3	199	59.2
Class 4	14	4.2
Class 5	37	11.0
Class 6	13	3.9

- -

Table 39

Classification of Nebraska School Districts[11]

Class 1 Districts maintaining only the elementary grades from kindergarten through the 8th grade.

Class 2 Districts under 1,000 population, maintaining both elementary and high school education

Class 3 Districts of 1,000 to 50,000 population, maintaining both elementary and high school education

Class 4 (Lincoln only) Districts of 50,000 to 200,000 population, maintaining both elementary and high school education

Class 5 (Omaha only) Districts of 200,000 or more population, maintaining both elementary and high school education

Class 6 Districts which are organized to maintain high school education only.

Table 40

Secondary Respondents by Position

Response	n=336	%
High School Teacher	253	75.3
Junior High Teacher	190	56.5
Curriculum Coordinator	12	3.6
Administrator	21	6.3

Table 41

Secondary Respondents by Grade Taught

Response	n=336	%
7th Grade	157	46.7
8th Grade	156	46.4
9th Grade	183	54.5
10th Grade	185	55.1
11th Grade	218	64.9
12th Grade	219	65.2

Table 42

Secondary Respondents by Subject Taught

Response	n=336	%
Science	202	60.1
Social Studies	128	38.1
Mathematics	56	16.7
Industrial Arts	34	10.1
Other	12	3.6

Table 43

Willingness to Pay for the BTU Project

Response	n=30	%
No	4	13.3
Probably	15	50.0
Definitely (Yes)	2	6.7
Unsure	10	33.3

Table 44

Are Additional BTU Necessary?

Response	n	%
Yes	12	48.0
No	13	52.0

Unit Title Suggestions	n
A. Solar Energy	3
B. Nuclear Power Plants	2
C. Wind/Geothermal	1
D. Future Energy Sources	3
E. Lab Exercises/AV Aids	3
F. Culture/Impact/World Energy	2
G. Ethics/Conservation	4

Table 45

Suggested BTU Media Development

Response	n=20	%
Graphics	4	13.3
Filmstrips	8	26.7
Videotapes	7	23.3
Audio Cassettes	3	10.0
Films	2	6.7
Other	1	3.3
Leave in Present Format	14	46.7

Table 46

Basic Teaching Units

Unit No.	Title	Subject Area(s)	Grades
1.	Fueling Around Could Be Hazardous to Your Health	Science	9-12
2.	Physical Laws of Electrical Power Generation	Physics Mathematics	11-12
3.	Energy Conservation in the Home	Science	7-9
4.	Oil: Fuel of the Past	Science Social Studies	7-12
5.	Yesterday, Today and Tomorrow	Science Social Studies	7-9
6.	Solar Energy in the Home	Science Social Studies	9-12
7.	Gasohol	Science	11-12
8.	Conservation with the "Double Nickel" and Carpooling	Science Social Studies Economics	7-12
9.	Economics and Energy	Economics	10-12
10.	Future Energy Technologies	Science Social Studies	10-12
11.	NO ENERGY!	Science	7-9
12.	Energy Uses in Nebraska Agriculture	Voc. Ag. Science	10-12
13.	Am I the Way?	Science Social Studies	7-9
14.	Energy in an Age of Scarcity	Social Studies	10-12
15.	National Energy Policy	Social Studies	9-12
16.	Energy from the Atom	Science	7-12

17.	Energy and Economics for Junior High Students	Social Studies Economics	7-9
18.	Energy Flow Through A Food Chain	Biology	9-10
19.	COAL: Fuel of the Past, Hope of the Future	Science Social Studies	10-12
20.	Energy Conservation in the School Building	Science Mathematics	9-12
21.	The History of U.S. Energy Usage	Social Studies	7-12
22.	Automotive Energy Efficiency	Industrial Arts	9-10
23.	Oil Shale: The Reluctant Energy Source	Science	9-12
24.	Hydroelectric Power: Energy From Falling Water	Social Studies Science	9-12
25.	Oil Refineries: What Do We Get From A Barrel of Crude Oil?	Science	9-12
26.	Gasohol Supplement	Science Chemistry	11-12
27.	Motor Vehicle Fuel Economy	Science Industrial Arts	11-12
28.	The U.S. and OPEC: Where Do We Go From Here?	Social Studies	7-9
29.	Tour of a Nuclear Power Plant (Slide Presentation)	Science Social Studies	7-12
30.	Tour of a Coal-Fired Power Plant (Slide Presentation)	Science Social Studies	7-12

	Science	Social Studies	Math	Other
Junior High	9	7	0	2
Senior High	19	12	2	8

APPENDIX D

List of Educational Service Units

Educational Service Units

Unit No.	Address/Phone	Energy Contact	Counties Served
1.	Wakefield, NE 68784 (402) 287-2061	Gary Vopalensky	Cedar, Dakota, Dixon, Knox, Thurston, Wayne
2.	RFD #1, 2320 No. Colorado Ave. Fremont, NE 68025 (402) 621-7710	Fred Hoofer	Burt, Cuming, Dodge, Saunders
3.	4224 South 133rd St. Omaha, NE 68137 (402) 330-2770	Patrick Geary	Cass, Douglas, Sarpy, Washington
4.	919 16th Street Auburn, NE 68305 (402) 274-4354	Robert Pfeiffer	Johnson, Nemaha, Pawnee, Otoe, Richardson
5.	Rural Route #2, Box 36 Beatrice, NE 68310 (402) 223-5277	Ivan Simpson	Gage, Jefferson, Thayer
6.	P.O. Box 10 Milford, NE 68405 (402) 761-2181	Merle Ebers	Fillmore, Saline Lancaster, York, Seward
7.	2476 33rd Avenue Columbus, NE 68601 (402) 564-5612	Norman Ronell	Boone, Butler, Colfax, Nance, Platte, Polk
8.	106 West 3rd Neligh, NE 68756 (402) 887-5041	Jerry Mundorf	Antelope, Boyd, Holt, Madison, Pierre, Stanton, Wheeler
9.	P.O. Box 2047 Hastings, NE 68901 (402) 463-5611	James Warren	Adams, Clay, Southern Hall, Nuckolls, Webster
10.	West Highway 30 Kearney, NE 68847 (308) 237-5927	Fran Mayeski	Buffalo, Dawson, Garfield, Greeley Hall, Loup, Sherman, Valley
11.	P.O. Box 485 Holdrege, NE 68949 (308) 995-6585	Jerry Gronewold	Franklin, Furnas Gospher, Harlan, Phelps
12.	Times-Herald Bldg., Box 539 Alliance, NE 69301 (308) 762-1430	Joan Kollars	Box Butte, Morrill

Educational Service Units (Cont'd)

Unit No.	Address/Phone	Energy Contact	Counties Served
13.	4215 Avenue "I" Scottsbluff, NE 69361 (308) 635-3696	Creda Thompson	Banner, Scotts Bluff
14.	P.O. Box 77 Sidney, NE 69162 (308) 254-4677	Marge Curtiss	Cheyenne, Deuel, Garden, Kimball
15.	P.O. Box 398 Trenton, NE 69044 (308) 334-5160	Louis Hagan	Dundy, Hitchcock, Chase, Frontier, Hayes
16.	314 West First Street Ogallala, NE 69153 (308) 284-2900	Dan Heim	Arthur, Grant, Hooker, Keith, Logan, Lincoln, Perkins, Thomas
17.	207 North Main Street Ainsworth, NE 69210 (402) 387-1420	Robert Armstrong	Brown, Cherry, Rock, Keya Paha
18.	P.O. Box 82889 Lincoln, NE 68501 (402) 475-1081	Neal Cross	School District of Lincoln
19.	3902 Davenport Street Omaha, NE 68131 (402) 554-1111	Gary Caldwell	School District of Omaha

APPENDIX E

Dissemination Methodology/Samples

Dissemination Methodology

The following outline describes the various efforts employed by the Nebraska Energy Office to publicize the availability of the Energy Conservation Activity Packets and Basic Teaching Units on Energy.

Newsletters

A. The Nebraska Energy News - bimonthly newsletter containing an article on energy education.

B. Nebraska State Department of Education - quarterly newsletters distributed by the science and social studies curriculum divisions.

C. NSEA News - weekly newspaper distributed by the Nebraska State Education Association. The NEO contributes an article twice per year; one article at the beginning of each academic semester.

National/State Clearinghouse Networks

A. ERIC/SMEAC - The BTU project is available in microfilm from the Educational Resources Information Clearinghouse/ Science, Mathematics, Environmental Education Action Center in Columbus, Ohio (The Ohio State University).

B. Midwest Energy Education Consortium - The ECAP and BTU projects are available for review from this 10-state regional clearinghouse.

C. Educational Service Units - 19 resource centers that serve Nebraska school districts. The ESU network has 3-5 complete sets of both the ECAP and BTU projects available for loan to all schools within the districts they serve.

D. Nebraska State Library Commission - has four complete sets of NEO curriculum materials available for a limited lending period.

In-Service

A. Direct School Request - The NEO arranges to conduct a 2-4 hour workshop for the appropriate teacher groups within a school district.

B. Classroom Update - a series of concurrent sessions held for a group of participating school districts. The NEO has presented a sectional at every session sponsored by the State Department of Education.

C. Pre-Service/Pre-Opening Conventions - the NEO has presented a sectional at each regional convention sponsored by the Nebraska State Education Association.

D. Teacher Institutes - the NEO has sponsored several 2-3 week summer teacher workshops at the University of Nebraska-Lincoln, Wayne State College, and Kearney State College.

Workshop Presentations

Workshops have been conducted for student teacher education groups to introduce energy education and provide a viable means for its implementation. Workshops of this type consist of one class period and have been conducted at the following locations:

Institution	Contact	Number of Times Conducted
University of Nebraska-Lincoln (Elementary Group)	Dr. Ward Sims	6
University of Nebraska-Lincoln (Secondary Science)	Dr. Donald McCurdy	3
University of Nebraska-Lincoln (Secondary Social Studies)	Dr. Clarice Ramsey	1
Wayne State College	Dr. Lyle Skov	2
Kearney State College	Dr. Lynn Johnson	4
Nebraska Wesleyan University	Mrs. Ila Horn	1

nebraska energy office

nebraska energy news

Vol. 4 No. 4 January, 1982

Comments on Our Energy Future

by Senator Don Wesely, Lincoln, Nebraska

Energy efficiency improvements and renewable energy can contribute very significantly to the solution of our energy problem. Recent authoritative studies show that the potential of these resources is much greater than had been previously thought. In a January 1981 article, Dr. John Lagerstrom claimed that "solar, the wind, and other alternatives . . . do not promise much relief before the year 2,000," and that energy efficiency improvements since 1973 have reduced our consumption by 9 percent, but "we cannot expect similar reductions in the next decade." I believe his assessment of these resources is much too pessimistic.

An important point is the way in which one conceptualizes energy conservation. Dr. Lagerstrom says that we should continue the "ethic" of conservation, implying that conservation is an act of altruistic self-denial. On the other hand, energy conservation can be seen as a hardheaded, cost-effective means of meeting our energy needs by using energy more efficiently. This latter approach I will call "energy efficiency improvements" rather than conservation, because the term "conservation" too often conjures up ideas of an "ethic" rather than a cost-effective resource.

There is a remarkable similarity of views among several studies as to how inefficiently the United States uses energy. Both the 1979 Presidential Council on Environmental Quality and the prestigious Harvard Business School Energy Project conclude that we could use 30-40 percent less energy today with efficiency improvements which are presently economical on a life-cycle cost basis. Some efficiency improvements would *save* energy at 10-50 percent of the cost of *producing* the same amount of energy from conventional sources. If various institutional and informational barriers were removed, and policies were designed to encourage efficiency as much as possible, the Harvard Business School study and a recent comprehensive Solar Energy Research Institute (D.O.E.) study conclude that the U.S. could maintain a high rate of economic growth and still use 20-25 percent less energy in the year 2,000 than we do today.

Efficiency improvements above and beyond voluntary conservation due to price increases may be coming faster than Dr. Lagerstrom predicts. He projects energy use to increase at "about one to two percent per year." However, overall energy use in the U.S. declined by 4 percent from 1979 to 1980, while in New England, where more aggressive energy efficiency and renewable energy programs have been implemented, overall energy use declined 6.5 percent from 1978 to 1980 (while employment and real personal income increased substantially). As energy inflation races on, old patterns of energy consumption and inefficiency are likely to change even more. The American Petroleum Institute notes that "Evidence from recent years shows that voluntary energy conservation in response to price changes has been significant." The U.S. may well experience less than 1-2 percent growth in energy use per year.

Renewable energy also holds more promise than Dr. Lagerstrom predicts. Independent studies by the Harvard Business School, the Solar Energy Research Institute (D.O.E.), the Audubon Society, and the D.O.E. Domestic Policy Review of Solar Energy indicate renewable energy could meet 20-25 percent of our energy need in the year 2,000. These studies all find renewable energy plus efficiency improvements to be the most economical and rapid course in reducing our dependence on imported

(Continued on page 2)

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Wind Energy Handbook 7
Winter Driving 8

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Solar Home Tours

The Nebraska Solar Office is conducting a series of solar home tours in communities across the state. The first was held in Lincoln and Denton, Sunday, December 6. These residences were open to the public from 1:00 to 5:00 p.m. and included examples of passive systems, active systems, retrofits and greenhouses.

If you have a home you would like to have included on a tour or you represent a community group that would like to co-sponsor a tour, please contact the Nebraska Solar Office, W191 Nebraska Hall, Lincoln, NE 68588-0526 or call (402) 472-3414.

Education Review Materials Available

Elementary Curriculum Materials

The Nebraska Energy Office invites elementary educators to consider incorporating the subject of energy into their instruction this academic year.

Teaching students to become aware of and apply energy concepts helps promote energy conservation while preparing them for an energy conscious future.

If you need energy education resource material (or know of someone who does), the NEO provides a curriculum project entitled, "Energy Conservation Activity Packets" (ECAP). The ECAP package takes an interdisciplinary approach to teaching energy concepts. The package is divided into five individual grade packets (K-2, 3, 4, 5, 6) designed to meet elementary basic skill needs in the following areas: science, math, reading, social studies, art, physical education, and values clarification. Each grade-level packet takes into account a student's cognitive, conceptual, and reading level while exploring the world of energy.

You may obtain this curriculum package at no cost by fulfilling two conditions:

1) Your letter should be written on school district stationery; and
2) You should specify the grade level(s) taught.

Included with each ECAP request are the following publications:

1) *Nebraska Energy Resources Directory*—lists available print, media aids, and speakers for five regions of the state of Nebraska; and
2) *Science Activities in Energy*—simple science experiments using household materials. Topics covered include conservation, wind, solar, electrical and chemical energy (while supply is available).

Secondary Curriculum Materials

The NEO secondary project "Basic Teaching Units on Energy" is in the process of revision. The original thirty units are still available for a limited period of time. The revision is being conducted in response to a statewide evaluation of the project.

For further information, address inquiries to:

Larry Scharmann, Education Coordinator
Nebraska Energy Office
P.O. Box 95085
Lincoln, NE 68509
(402) 471-2867

Energy Facts or Myths?

How much do you know about saving ENERGY in your home? The following quiz, prepared by the National Home Builders Research Foundation, will test your ability to distinguish between myth and fact regarding ENERGY-saving products, practices, and equipment:

1. The most effective step to save household ENERGY in an average home is to (a) blow insulation into exterior walls, (b) turn down water heater temperture setting, (c) insulate exposed pipes.
2. In buying insulation, specify it by (a) thickness in inches, (b) mineral wool or foam composition, (c) R-value.
3. Heat pumps are most efficient and economical in (a) hot climates, (b) moderate climates, (c) very cold climates.
4. The way to save ENERGY during winter nights is to (a) raise furnace thermostat 5 degrees, (b) leave thermostat at normal temperature so home does not chill at night, (c) install a clock thermostat and set for 10-degree nighttime reduction.
5. The largest ENERGY loser in a typical home is (a) fireplace, (b) refrigerator, (c) front door.
6. For maximum ENERGY efficiency, windows should be (a) on east and west walls, (b) on south wall only, (c) on north and south walls.
7. Triple-glazed windows (insulating window plus storm) in place of single-pane windows will reduce ENERGY loss through window area by (a) 20 percent, (b) 40 percent, (c) 60 percent.
8. In a poorly-insulated home, the most effective part to insulate is (a) attic, (b) basement or crawl space, (c) walls.
9. Sealing and insulating exposed heating ducts and water pipes in garage, crawl space, or other unheated area will reduce heating costs up to (a) 1 percent, (b) 2-3 percent, (c) 5-10 percent.
10. Given today's and tomorrow's ENERGY costs, attic insulation in most areas should be (a) R-8 to 19, (b) R-19 to 30, (c) R-30 to 38.

Quiz Answers: 1-b, 2-c, 3-b, 4-c, 5-a, 6-b, 7-c, 8-a, 9-c, 10-c.

Energy Tips Offered In Children's Art Calendar

The Nebraska Federated Womens Club (NFWC), in cooperation with the Nebraska Energy Office, has printed an energy calendar for 1982.

Illustrated with original poster art from a contest for children sponsored by NFWC last winter, the calendar features a different art view of energy problems and solutions with each month.

Energy tips for the home also are featured with each month in the calendar, which is available for the printing cost of $1.75. To purchase calendars, contact Mardel Meinke, Nebraska Energy Office, (402) 471-2867.

NEBRASKA DEPARTMENT OF EDUCATION - 301 CENTENNIAL MALL SOUTH - LINCOLN, NE 68509
(402) 471-2295

January, 1982

WINTER SCIENCE NEWSLETTER

TO: Nebraska Science Teachers

FROM: DON WOODBURN, Ph.D., Science Consultant

Welcome to snow country! As this issue of the science newsletter is being prepared a beautiful scene is developing outside. Again, the countryside is receiving the full force of a typical Nebraska winter.

This newsletter contains announcements from several groups, part II of a laboratory safety study, and other useful goodies. As always, we welcome news items from each of you regarding upcoming events, special awards or other interesting facets of science education in Nebraska.

* FLORENCE BORING--OUR NEW NASM RESOURCE PERSON *

Florence Boring, recently retired from teaching science at Millard Lefler Junior High School, Lincoln, attended a week's intensive seminar at the Smithsonian Institution's National Air and Space Museum (NASM) in Washington, DC, July 27-31, 1981. She is now serving as Regional Resource Person for NASM.

Florence reports that it was a wonderful week of lectures and demonstrations by NASM's curatorial staff, group activities, and guest speakers. Curators gave special tours of their specific galleries. NASA and the FAA presented much valuable information and many materials.

Highlight of the program was the lecture-demonstration of the restoration of the airplanes and the tour of the Paul E. Garber Restoration and Storage Facility, formerly known as Silver Hill, by its chief curator, Robert Mikesh. Participants were brought well up to date on the Space Shuttle, both the inner and the outer planets, and the Voyager mission. The wide-screen films, "To Fly" and "Living Planet," and the Spacearium program, "New Eyes on the Universe," open to all Museum visitors, were among the real treasures.

The Regional Resource Program is designed to provide not only background information in aviation and space science but also the media to accompany the Regional Resource Person's presentations, seminars, or workshops for teachers, students, and the general public. For additional information, please contact Florence Boring at 2830 South 40th Street, Lincoln, NE 68506.

** NATIONAL WILDLIFE WEEK KITS NOW AVAILABLE **

The Nebraska Game and Parks Commission has announced the availability of the 1982 Wildlife Week Kits. This year's theme is "We Care About Eagles," and is set for the week of March 14-20. The education kits contain conservation education materials that develop the "We Care About Eagles" theme. The teacher's guide gives specific suggestions for learning experiences for all grade levels and the two posters provide an attractive and stimulating centerpiece for classroom study of eagles worldwide.

The number of wildlife kits available are limited, so please coordinate with your staff the number you will need as they will be mailed on a first come first served basis. To receive a wildlife week education kit, write to: Nebraska Game and Parks Commission, Wildlife Week Kit, P. O. Box 30370, Lincoln, NE 68503.

*** NEW FOOD CURRICULUM--GET IT WHILE IT'S HOT! ***

The Dairy Council has a new program that probes the science of nutrition through biological, chemical, and ecological investigations.

Food is more than something to eat. Foods supply nutrients--chemical substances upon which life depends. After all, the very framework of life is built on nutrients from food. Also many scientific controversies surround food. The relationships of diet, nutrients, health and disease spark scientific investigations.

The Dairy Council of Central States has a new program, FOOD...Your Choice Level 4, Science, designed just for you. It presents nutrition concepts in practical, effective, exciting ways. It deals with contemporary issues, appeals to students in grades 7 to 10 and is easy to implement.

For further information, contact Dairy Council of Central States, 76th and Main, Hillcrest Office Building, Suite 103, Ralston, NE 68127.

**** ENERGY MATERIALS AVAILABLE FOR NEBRASKA TEACHERS ****

A. Elementary Curriculum Materials

The Nebraska Energy Office invites elementary educators to consider incorporating the subject of energy into their instruction this academic year.

Teaching your students to become aware of and apply energy concepts helps to promote energy conservation while preparing them for an energy conscious future.

If you are in need of energy education resource material (or know of someone who is), the NEO provides a curriculum project entitled, "Energy Conservation Activity Packets" (ECAP). The ECAP package takes an interdisciplinary approach to teaching energy concepts. The package is divided into five individual grade packets (K-2, 3, 4, 5, 6) designed to meet elementary basic skill needs in the following areas: science, math, reading, social studies, art, physical education, and values clarification. Each grade-level packet takes into account a student's cognitive, conceptual, and reading level while exploring the world of energy.

You may obtain this curriculum package at *no cost* by fulfilling two conditions:

1) Your letter should be written on school district stationery; and

2) You should specify the grade level(s) taught.

Included with each ECAP request are the following publications:

1) Nebraska Energy Resources Directory - lists available print, media aids, and speakers for five regions of the state of Nebraska; and

2) Science Activities in Energy - simple science experiments using household materials. Topics

covered include conservation, wind, solar, electrical and chemical energy (while supply is available).

B. Secondary Curriculum Materials

The NEO secondary project "Basic Teaching Units on Energy" is in the process of revision. The original thirty (30) units are still available for a limited period of time. The revision is being conducted in response to a statewide evaluation of the project.

Other resources available include:

1. Energy Efficiency for Drivers Education - a handbook for students that promotes energy conservation through improvements in driving skills. The original instructor's manual has now been incorporated into the Nebraska State Driver Education Association's curriculum guide. Multiple student copies are available;

2. Driver Energy Conservation Awareness Training (DECAT) - a service provided to driver education instructors, fleet operators, and the general public. DECAT teaches that money and fuel can be saved through improvements in driving technique, trip planning, vehicle maintenance, and purchase decision making. DECAT is offered as a 4-hour student workshop or 16-hour instructor's course;

3. Traditional 4-H Energy Project - a curriculum package divided into three parts for separate age groups. Each age grouping contains a leader's and student's guide to energy related activities. Copies of all materials can be obtained from Dr. Glen Krohn, Cooperative Extension Service, University of Nebraska-Lincoln, Ag. Hall, Room 116, Lincoln, NE 68583;

4. Energy and Environment Simulator - a computer decision-making game that allows participants to make judgments on the use of energy resources, environmental effects, energy and economic growth, and the quality of life. Two simulators, funded by the NEO, are housed at Wayne State College and loaned out free of charge. Simulator training workshops have been held for strategically located teachers and college professors across the state. Contact Mr. Dean Metz, Wayne State College, Wayne, NE 68787, (402) 375-2200, for more information;

5. The Energy Conservation Resource List - a quarterly up-date of brochures, pamphlets, and media materials that are available from the NEO. This list is provided to schools upon request and no charge is made for the publications;

6. Saving Energy - What Can We Do? - a publication that promotes energy conservation ideas that can be implemented by student councils in Nebraska schools. The brochure discusses carpooling incentives, conservation sponsorship plans, and community involvement. This project is a cooperative effort of the NEO and Field Services Division of the Nebraska Department of Education.

For further information or to order materials, address all inquiries to: Larry Scharmann, Education Coordinator, Nebraska Energy Office, P. O. Box 95085, Lincoln, NE 68509, (402) 471-2867.

***** EARTH SHELTER HOME AVAILABLE FOR TOURS *****

AN OPEN LETTER TO YOUTH GROUPS AND SCHOOLS:

Since last May educational tours have been provided on numerous weekends of the first earth shelter home within the city of Lincoln. A number of groups have held their meetings in this home with a program of slides and discussion. These educational programs are now available in the afternoons and evenings by special arrangement for children, youth, and adults on a first come first serve basis.

Special features of this home include * active and passive solar energy * passive air conditioning * barrier free design for easy use of a person in a wheelchair * A garden on the roof * A root cellar with an earth floor * Energy savings of about 80% for heating and cooling * Satellite TV reception with 24 additional channels * Electronic controls for lights, appliances, telephone and watering house plants * Infrared activated lighting system * Ion conditioning for the air. * This unique home combines beauty, security from storms with lots of light and fresh air at a cost no higher than conventional construction above ground.

If your group or class would like to schedule a special meeting in this home, please contact Mr. Lincoln Justice. He would like groups to be no fewer than 10 and not more than 30 persons. Programs take about one hour. For further information, please write to: Mr. Lincoln Justice, 5212 Hyde Park Ct., Lincoln, NE 68516, (402) 423-3444.

A SURVEY OF SCIENCE LABORATORY SAFETY PROCEDURES, SAFETY EQUIPMENT, AND FACTORS CAUSING ACCIDENTS IN THE SECONDARY SCHOOLS OF NEBRASKA

****** ******

As you may recall from reading the fall newsletter, I presented you with Part I of the findings from a study of laboratory safety factors in Nebraska. In Part I, the results were given of the analysis of direct safety factors. Listed below are some highlights of the findings relative to indirect safety factors.

Part II--Indirect Safety Factors

The indirect safety factors were those situations which did not imply an immediate relationship to accidents. Sixteen research questions dealt with indirect safety factors.

The research topics which dealt with accidents indirectly were: years of teaching experience, school enrollment, class enrollment, course level, type of course, junior vs. senior high, laboratory arrangement, workspace allotment, age of facility, knowledge of legal liability, safety programs, safety inservice training, student safety equipment, and classroom safety equipment. As one might expect, some of the factors were found to show no significant relationship to laboratory accidents.

--In the comparison of laboratory accidents to years of science teaching experience it was determined that teachers with one to three years of experience were significantly below the population mean. Teachers with nine to fifteen years of experience were significantly above the population mean.

--the comparison of laboratory accidents to various school enrollment groups revealed that small schools averaged fewer accidents. The smallest enrollment group of 1-250 pupils was one standard deviation below the accident mean, while two enrollment groups (501-750; 751-1000) were greater than one standard deviation above the accident mean. The other enrollment groups were not found to be significantly different.

--The relationship of class enrollment to number of accidents was an interesting research finding. The class enrollment comparison with laboratory accidents resulted in the determination that very small enrollments of 1-10 students are greater than one standard deviation below the accident mean. Generally, as class enrollment

Materials available . . .

Energy Ed needs added emphasis

Why promote a 'National Energy Day?' One possible reason is that "more than 80% of Nebraska's teachers don't realize that free teaching materials are now readily available from the Nebraska Energy Office."

The quote is from NEO Education Coordinator Larry Scharmann. He hopes that by calling attention to 'National Energy Day' on March 19, more of the state's educators will seek information on . . .

- 'Energy Conservation Activity Packets,' designed for grades K-6.
- 'Basic Teaching Units On Energy,' materials prepared for classroom use in grades 7-12.

'National Energy Day' was recently passed by Congress and signed by the President as a resolution confirming the national commitment and need for Energy Education.

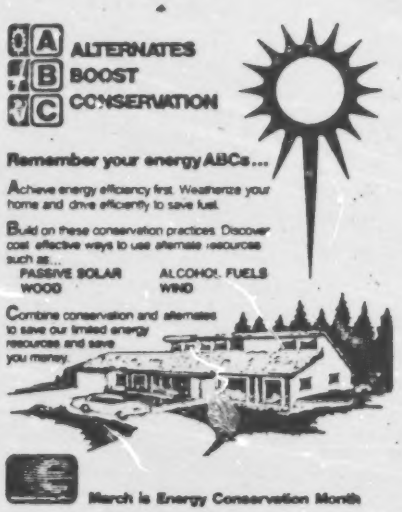
According to Larry, "many Nebraska schools still don't perceive a need for specialized instruction on the subject of energy." This attitude, he said, runs counter to the nation's long-range goal of energy self-sufficiency, and must be changed.

With such change in mind, "a strong commitment to Energy Education is one means of providing Nebraska students with the information they'll eventually need to make required decisions."

Larry added that Energy Education involves more than teaching students to turn off lights, turn down thermostats and drive 55. Conservation of energy is important, he said, but is only a part of Energy Education. He views the total package as '3 C's:' citizen, consumer and career awareness.

What are the benefits of Energy Education? More than per-year savings on utility bills, Larry believes. They also include an indirect change of attitude and behavior toward energy in general.

To help promote energy conservation in your school this month, the wall-size poster shown below of NEO's statewide campaign is available free on a first-request basis. To order it, or for more details on the free energy-curriculum materials, contact Larry Scharmann at the Nebraska Energy Office. Address: Box 95085, Lincoln 68509.


A ALTERNATES
B BOOST
C CONSERVATION
Remember your energy ABCs...
Achieve energy efficiency first. Weatherize your home and drive efficiently to save fuel.
Build on these conservation practices. Discover cost effective ways to use alternate resources such as...
PASSIVE SOLAR
WOOD
ALCOHOL FUELS
WIND
Combine conservation and alternates to save our limited energy resources and save you money.
March is Energy Conservation Month

Like to help promote energy conservation in your school this month? This black-and-white poster comes in wall-mounting size, and is now available free from the Nebraska Energy Office in Lincoln. For information on how to order the poster, see the story starting above.

CRUISE ALASKA
14 days 7 ports
(Teachers earn credits)
Box 153 EN, Germantown, WI 53022
(414) 255-3497 after 4 p.m.

KEARNEY STATE COLLEGE
Department of Counseling and Educational Psychology

OF SPECIA ON NETV IN MARCH

Weeknightly:
The Nightly Business Report a
The MacNeil/Lehrer Report at
Capitol View at 10:30 p.m. Live

NOTE: From Saturday, March 6
Festival '82 features special pr
annual public awareness/mem
Nebraskans for Public Televisi
programming may be preempt

SUNDAYS
Nova at 7 p.m. Palace of Delight
Exploratorium, a young people
Imposters (3/14); Aging: The M
Masterpiece Theatre at 8 p.m.
3/21); Love in a Cold Climate (
Gala of Stars 1982 at 8 p.m. (3
opera, dance, symphony, theat

MONDAYS
The Neuron Suite at 7:05 p.m.
human brain and nervous syste
at 11:15 p.m. 3/19.)
Bernstein/Beethoven at 9:30 p
3/22) Maximilian Schell co-hos
Pavarotti: King of the High C's
America's favorite tenor. (Repe

TUESDAYS
Penguin Summer at 7:05 p.m.
of this curious bird during bree
Life on Earth at 8 p.m. David Att
the Mammals (3/9); Theme anc
about anteaters, moles, bats, p
Kingdom Hunters and Hunted (
American Playhouse at 9 p.m. fe
The Great American Fourth of J
Jean Shepherd (3/16 at 9:25 p
Michael Roemer (3/23); Northe
Hanson and Rob Nilsson, shot i
River of Sand at 9:10 p.m. (3/9)
wildlife in Kenya.
The Vanishing Giants at 10:10
great whales.

WEDNESDAYS
National Geographic Special:
(3/10) shows migratory proble
The Costeau Odyssey at 8:10 p
mammals.
We Live With Elephants at 9:20
adventure story of a family livin
Middletown at 9 p.m. (premieri
about the condition of the Am
Muncie, Indiana.

THURSDAYS
Becket at 7 p.m. (3/11) is dram
and state in 12th century Englan
Peter O'Toole.
Creativity with Bill Moyers at 9
painter/sculptor Gerald Scheck

FRIDAYS
Tony Brown's Journal at 8:30 p
the Military (3/5); Destruction o

SATURDAYS
Girls' State High School Basket

easy on energy

ENERGY CURRICULUM MATERIALS
available
from
NEBRASKA ENERGY OFFICE

BTU'S
Basic Teaching Units on Energy

The enclosed chart describes a series of 16 Basic Teaching Units (BTUs) on Energy that have been designed for senior high school students. These units are part of a 22 unit package (covering both junior and senior high school) that has been developed by Nebraska classroom teachers at three summer writing workshops. These workshops, jointly sponsored by University of Nebraska-Lincoln Teachers College, the United States Department of Energy, and the Nebraska Energy Office, brought teachers from all parts of Nebraska to Lincoln in an effort to pool experience and ideas. If you would like additional information about these Basic Teaching Units on Energy and other curriculum materials, please return the coupon. Thank you.

Address inquiries concerning energy curriculum material to the attention of:

Larry Scharmann, Education Coordinator
Nebraska Energy Office
P.O. Box 95085
Lincoln, Nebraska 68509

Name _____ School _____

Street _____

City _____ State _____ Zip _____

easy on energy

NEBRASKA
BASIC TEACHING UNITS ON ENERGY
SENIOR HIGH SCHOOL

the next generation will thank you for it.

Unit Title	Unit Number	Targeted Application	Unit Description
COAL: FUEL OF THE PAST, HOPE OF THE FUTURE	19	Science Social Studies	Looks at the role coal has played in our past, at the physical properties of coal, how it is mined and where it is found, as well as what coal's potential for the future is.
CONSERVATION WITH THE "DOUBLE NICKEL" AND CARPOOLING	8	Science Social Studies	Examines the economic and conservation benefits of carpooling and following the 55 mph speed limit.
ECONOMICS AND ENERGY	9	Economics	Investigates basic concepts such as supply and demand using oil as the focus. The effects of rationing on supply and demand is considered.
ENERGY IN AN AGE OF SCARCITY	14	Social Studies	Emphasis on the role of energy from a global perspective and the impact scarcity has on the individual.
ENERGY FROM THE ATOM	16	Science	Focuses on background information for a more in depth look at the role and future of nuclear energy in this country.
ENERGY CONSERVATION IN THE SCHOOL BUILDING	20	Math Science	Students analyze the energy efficiency of their school to determine whether the building meets minimum energy efficiency requirements.
ENERGY FLOW THROUGH A FOOD CHAIN	18	Biology Home Economics Vocational Agriculture	Starts with photosynthesis and follows the energy chain in food through its use by man and his preparation of it for use at the table.
ENERGY USES IN NEBRASKA AGRICULTURE	11	Science Social Studies Vocational Agriculture	Three important energy uses in agriculture are investigated...machine operation, irrigation, chemicals. Energy efficiency in this important economic sector is considered.
FUELING AROUND COULD BE HAZARDOUS TO YOUR HEALTH	1		Actual automobiles are used in a series of laboratory investigations to heighten awareness of automobile emission problems.
FUTURE ENERGY TECHNOLOGIES	10	Science Social Studies	Examines some promising energy technologies of the future...barriers to be overcome, possible environmental consequences, time frames for these technologies to mature.
GASOHOL	7	Chemistry	Three laboratory experiments...distillation, fermentation, and heat of combustion... designed to produce awareness of gasohol as an energy alternative.
HISTORY OF UNITED STATES ENERGY USAGE	21	Social Studies	Historic transitions of energy use, e.g., wood to coal, are considred and compared with today's energy transition.
NATIONAL ENERGY POLICY	15	Social Science	The steps followed in development of a National Energy Policy are considered. Role playing activities encourage searching for alternatives to the policy.
OIL: FUEL OF THE PAST	4	Social Science	A simulation game to demonstrate that crude oil is a finite fuel source and that no matter what variables are involved, mankind will be forced to use alternative fuels in the future.
PHYSICAL LAWS OF ELECTRICAL POWER GENERATION	2	Physics Chemistry	The second law of thermodynamics is used to investigate the processes of electrical power generation and the problems of efficiency.
SOLAR ENERGY IN THE HOME	6	Science Social Studies	Passive solar technology that is available today and heating and cooling, photovoltaic conversion, and biomass conversion are highlighted.

Help Conserve the Good Life of Nebraska

CURRICULA

SERVICES

PROJECTS

PUBLICATIONS

ENERGY EDUCATION

January, 1982

The Nebraska Energy Office is involved in a comprehensive program in energy education. Personnel from every level of educational expertise have provided support and assistance in the development of the projects encompassed by our program. Notable support has been provided by the University of Nebraska, Nebraska Department of Education, state colleges, community colleges, and various public and private secondary and elementary schools. The paragraphs that follow briefly detail these projects.

CURRICULUM MATERIALS

1. Energy Conservation Activity Packets (ECAPs): This K-6 elementary curriculum package takes an interdisciplinary approach to teaching energy concepts. The package is divided into 5 packets (K-2, 3, 4, 5, 6) designed to meet elementary basic skill needs in the areas of science, math, reading, social studies, art, physical education, and values clarification. Each grade-level packet takes a student's cognitive, conceptual, and reading level into account while exploring the world of energy. Requests for materials should be written on school stationery and should specify grade level(s) taught.

2. Basic Teaching Units on Energy (BTUs): This 7-12 secondary curriculum package is composed of a series of instructional units for use in the academic disciplines of science, social studies, economics, industrial arts, agriculture, and mathematics. The original 30 units are now undergoing revision to improve their quality and update factual data. Objectivity is maintained in discussing the complex issues encompassed by the energy situation.

3. Energy Efficiency for Drivers Education is a handbook for students that promotes energy conservation through improvement in driving skills. The original instructor's manual has now been incorporated into the Nebraska State Driver Education Association's curriculum guide. Multiple student copies are available, for a limited period of time.

4. Traditional 4-H Energy Project is a curriculum package divided into three parts for separate age groups. Each age grouping contains a leader's and student's guide to energy-related activities. Copies of all materials can be obtained from Dr. Glen Krohn, Cooperative Extension Service, University of Nebraska - Lincoln, Ag. Hall, Room 116, Lincoln, NE 68583.

5. Home Economics Energy Management Guide is designed as a supplement to an existing curriculum in home economics. The guide includes 25 lessons with background information, activities, ready-to-duplicate visuals and resources on energy management for the areas of: housing, food, clothing, and the family. The cost of this guide is $12.50.

6. Energy Efficiency for Vocational-Industrial Trades is a five-part curriculum series for community college instructors. The five curriculum guides were designed to be incorporated into an existing program of:

   (A) Architectural Drafting
   (B) Automotive Technology
   (C) Building Construction
   (D) Electrical Technology
   (E) Heating, Ventilating, Air Conditioning

   The objective of this series is to provide vocational trade instructors in Nebraska with a format to achieve continuity in their approach to teaching energy efficiency techniques.

SERVICES

1. Driver Energy Conservation Awareness Training (DECAT) is a service provided to driver education instructors, fleet operators, and the general public. DECAT teaches that money and fuel can be saved through improvements in driving technique, trip planning, vehicle maintenance, and purchase decision-making. DECAT is offered as a 4-hour student workshop or 16-hour instructor's course.

2. Computer-Aided School Bus Routing Service is now available to school districts in Nebraska for the design of rural school bus routes. Based on a definition of the routing problem supplied by the school district, the service provides a feasible set of routes which reduce route mileage, fuel consumption by 5-15%, and maintenance costs associated with school bus operation. The fee for this service is currently $100 per existing route. The routing service is being provided by the State Department of Education, Field Services Division in cooperation with the NEO and the University of Nebraska-Lincoln.

3. Driver Education Materials: The Doron Company slide/tape A-V package was field tested during the 1979-80 academic year by 100 Nebraska school districts. It became available statewide during the 1979-80 school year and can be obtained through the Educational Service Units.

4. Saving Energy - What Can We Do? is the title of a workshop designed to introduce energy education as a viable conservation measure. Target audiences include pre-service teachers, student teachers, and high school student councils. An accompanying brochure discusses carpooling incentives, conservation sponsorship plans, and community involvement.

5. Teacher In-Service is provided on a request basis. This consultation service is designed to aid interested school districts in implementing energy education curricula. Specific emphasis is placed on implementing Nebraska's "Basic Teaching Units on Energy" and "Energy Conservation Activity Packets".

6. Conferences: In addition to the public meetings conducted specifically in support of energy education and other Plan measures, certain workshops that the NEO participated in have involved speaking, panel displays and referral services for other agencies. Home shows, energy audit programs, teacher-training institutes, utility displays, industry/government conferences and alternate energy fairs have been supported by a variety of such appearances. The high point of this activity was a booth at the 1981 Nebraska State Fair, equipped and manned by the NEO.

PROJECTS

1. Energy and Environment Simulator: This computer decision-making game allows participants to make judgments on the use of energy resources, environmental effects, energy and economic growth, and the quality of life. Two simulators, funded by the NEO, are housed at Wayne State College and loaned out free of charge. Simulator training workshops have been held for strategically located teachers and college professors across the state. Contact Mr. Dean Metz, Wayne State College, (402) 375-2200, for more information.

2. The Mobile Alternative Energy Center provides educators and students with technically sound, useful devices which demonstrate the basic concepts of alternative energy sources such as hydroelectric, active and passive solar, wind, and geothermal. The Center is housed at Educational Service Unit #3 (ESU #3 serves the Omaha suburban schools) and is available to all educational service units throughout the state. Contact Mr. Patrick Geary, ESU #3 (402) 330-2770, for more information.

3. Energy Experiential Display: The Children's Museum in Omaha has completed the construction of a "hands-on" museum display depicting energy concepts and alternative energy sources for elementary students. Funded by the Nebraska Energy Office, this display is an exciting and worthwhile experience. Contact the Children's Museum, (402) 342-6163, for museum hours and further details.

4. Driver Education Simulator: The NEO is providing simulation equipment at two selected sites to identify energy conservation driving/teaching techniques. The simulator saves fuel and maintenance costs on driver's education vehicles by reducing "behind the wheel" instruction. This project is a cooperative effort of the NEO, Nebraska Safety Center (Kearney State College), and Educational Service Unit #10 (Kearney).

5. Russian Fireplace Demonstration: The NEO provided funds for the construction and efficiency testing of this alternative fireplace design. Initial data analysis indicates that the Russian fireplace is about three times more efficient than a traditional fireplace. A report complete with specifications, building materials, and construction costs is available upon request. A descriptive brochure is also available.

6. Elementary Teacher's Energy Workshop (June 7-18, 1982): The NEO has provided funds to Wayne State College for the purpose of training 40 K-8 teachers in energy education and the use of energy-related curriculum materials. For additional information and registration contact Lyle L. Skov, Wayne State College, (402) 375-2200.

PUBLICATIONS

1. Energy Resources Directory: For this project, the NEO divided the State into five regions to produce a product that would provide teachers and other interested individuals with local sources of energy information materials. The Directory has been referenced by fuel type, and includes print, nonprint, speaker, and tour information for energy in Nebraska. The Directory is a supplement to all NEO energy education materials.

2. Studies in Energy (A Nebraska College Guide): This guide lists energy-related course work available at Nebraska's state colleges, community colleges, and major universities. The guide is intended for high school guidance counselors, collegiate advisors, and the general public.

3. Energy Info is a directory of publications and audiovisual materials available from the Nebraska Energy Office. The material in this directory is updated on a quarterly basis.

4. Nebraska Energy Saving Manual presents a compilation of useful residential techniques for saving energy. The Manual is also an excellent text for use in credit/non-credit course work in residential conservation. The original cost of this guide was 50¢ per book but special arrangements have been made to provide small quantities, without cost, to all interested educators.

5. Nebraska Passive Solar Primer is an outstanding reference and resource text designed for the architect, engineer, builder-contractor, and homeowner. The Primer provides information on the design, construction, engineering, economics, and legal aspects of building an energy-efficient passive solar-heated home. The cost of this publication is $6.50.

All inquiries regarding these projects should be addressed to:

Larry Scharmann
Education Coordinator
Nebraska Energy Office
P.O. Box 95085
Lincoln, NE 68509
(402) 471-2867

Pre-Opening Activities

MEETING LITERACY NEEDS TODAY

August 21, 1981
Holdrege High School

HOST
HOLDREGE HIGH SCHOOL
Dr. Hudson Lasher, Superintendent

SPONSOR
EDUCATIONAL SERVICE UNIT NO. 11
Rodney Smith, Administrator

P R O G R A M

9:00 a.m. - 9:15 a.m. - Welcome - Announcements

9:15 a.m. - 10:15 a.m. - Keynote Address, Dr. Granowsky

10:30 a.m. - 11:30 a.m. - First Sectional

11:30 a.m. - 12:50 p.m. - Lunch - (Local Restaurants) list enclosed

1:00 p.m. - 2:00 p.m. - Second Sectional

2:15 p.m. - 3:15 p.m. - Third Sectional

Photographs courtesy of the Phelps County Historical Society

RESTAURANTS

Cozy Inn Cafe	1120 4th Ave.
Dairy Queen	224 4th Ave.
Elks Lodge	311 East Ave.
Dale Hotel	805 4th Ave.
Godfathers Pizza	1501 Burlington St.
Kentucky Fried Chicken	229 West 4th Ave.
Pizza Hut	4th Ave. and Blaine St.
Sail Inn	1507 Burlington St.
The Villager	4th Ave. and Tibbals St.

1:00 Sectionals

Presenter	Room	Title Grade Level and Summary
Dr. Paul Bishop Lynn Conley	113	CARE OF EMERGENCY SITUATIONS K-12 Teachers (a) respiratory emergencies and cardiac arrest (b) seizure management (c) care of fractures and dislocations (d) care of other musculoskeletal injuries
Marilyn Jussel	116	COMPUTER - HANDS ON K-12 Teachers Participants will learn how to use pre-programmed software (MECC) on the Apple microcomputer and will also become familiar with types of computer-assisted-instruction.
Sherry Heinrichs	Cafeteria Westside 146	RAINBOWS, READING,'N' RHYME Elementary An array of everything under the rainbow which can be used for reading and language arts. "New" games and ideas will be presented.
Larry Scharmann	119	"ENERGY AND EDUCATION: FORGOTTEN FUNDAMENTALS" K-12 Teachers Is it the business for our schools to rescue us from every crisis? The problem of energy self-sufficiency requires a change in attitude. Can and will the schools be able to deliver? This sectional presents an objective overview of the energy "crisis" and the role that schools can plan in changing our attitudes toward energy.
Connie Bennett	128	THE DISABLED READER IN THE SECONDARY CURRICULUM WHO IS READING 2-6 YEARS BELOW APPROPRIATE GRADE LEVEL. Secondary How to adapt and individualize reading for the secondary student who is reading below level.
Nita Bramble	142	DENTAL HEALTH-A REVIEW OF PREVENTION Elementary The review will include brushing, flossing, plaque control, disclosing tablets and fluoride rinsing programs.

1:00 Sectionals

Presenter	Room	Title Grade Level and Summary
Julia Boettcher	Media Center	"MICROCOMPUTER -- DOORWAY TO OCCUPATIONAL INFORMATION" Counselors and other interested teachers The micro-Quest, which is a new and exciting sorting option available to the Nebraska Career Information System (NCIS) users, will be presented by the Nebraska Career Information System staff. The participants will have an opportunity to type in their answers to the QUEST questionnaire on the microcomputer, which sorts through Nebraska occupations and gives the participant an occupational list based upon individual interests and abilities.
Ed Kelley	N.W. Lecture Center	Principals and Head Teachers Clinic continuation of DESIGNING PERSONNEL APPRAISAL AND SUPERVISION SYSTEMS
Larry Fuerst	N.E. Lecture Center	School Secretaries and Office Support Staff AN INFORMATION PROCESSING SYSTEM TO SUPPORT SCHOOL ADMINISTRATION A brief history of Word Processing - An update on current technologies. Using these current technologies, the problems existing in the information handling and distribution areas for school administration can be solved. Also presented will be the effect of these technologies on career opportunities in the office of today and for tomorrow.
Dr. Mary Ellen Goodenberger	S.W. Lecture Center	THE SECOND "R" IS YOUR RESPONSIBILITY Secondary Student writing skills must be a matter of inter-disciplinary concern if we are to bring about any real improvement in this area. An all-faculty effort has paid off in the schools which have tried such an approach. How about your school? How about you? In this session we will look at our own writing and begin to identify specific writing skills. See you there!
Harold David Brown	S.E. Lecture Center	STRESS K-12 Teachers General discussion of stress, its causes, its cures. Information will be geared specifically toward the classroom teacher with a number of resources consulted and presented.
Jeanette Jackson	108	MATH IDEAS TO ENHANCE YOUR TEACHING Elementary Activities to reinforce basic computation skills and develop reasoning and thinking skills will be presented.

2:15 Sectionals

Presenter	Room	Title Grade Level and Summary
Sherry Heinrichs	Carleton in Westside 146	RAINBOWS, READING, 'N' RHYME Elementary An array of everything under the rainbow which can be used for reading and language arts. "New" games and ideas will be presented.
Larry Scharmann	119	"ENERGY AND EDUCATION: FORGOTTEN FUNDAMENTALS" K-12 Teachers Is it the business for our schools to rescue us from every crisis? The problem of energy self-sufficiency requires a change in attitude. Can and will the schools be able to deliver? This sectional presents an objective overview of the energy "crisis" and the role that schools can plan in changing our attitudes toward energy.
Janie Bennett	128	THE DISABLED READER IN THE SECONDARY CURRICULUM WHO IS READING 2-6 YEARS BELOW APPROPRIATE GRADE LEVEL. Secondary How to adapt and individualize reading for the secondary student who is reading below level.
John Bomleter	1[illegible]	SOLAR ENERGY WORKSHOP Secondary This solar energy workshop is designed to provide participants with an awareness of the consumption and management of energy sources by emphasizing solar energy as a practical alternative energy source.
Vicki Brandle	142	MENTAL HEALTH-CLASSROOM AND COMMUNITY PROJECTS Elementary The classroom and community projects will include availability of resource materials, films and student projects such as experiments, bulletin boards, posters.
[illegible] Wedel	202	WRITING POETRY Secondary I will examine some of the world's best poems to show teachers how they can use the basic thought processes of the poets as models for their own students to think in. These patterns of thought frequently give the students a push in the direction of their own creativity. The presentation will be lecture/discussion.

2:15 Sectionals

Presenter	Room	Title Grade Level and Summary
Julie Boetcher	Media Center	"MICROCOMPUTER -- DOORWAY TO OCCUPATIONAL INFORMATION" Counselors and other interested teachers The micro-QUEST, which is a new and exciting sorting option available to the Nebraska Career Information System (NCIS) users, will be presented by the Nebraska Career Information System staff. The participants will have an opportunity to type in their answers to the QUEST questionnaire on the microcomputer, which sorts through Nebraska occupations and gives the participant an occupational list based upon individual interests and abilities.
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Harold David Brown	S.E. Lecture Center	STRESS K-12 Teachers General discussion of stress, its causes, its cures. Information will be geared specifically toward the cl room teacher with a number of resources consulted and presented.
Dr. Paul Bishop Lynn Conley	113	GROSS AND FINE MOTOR ACTIVITIES FOR PLAY K-12 Teacher Presentation of activities intended to enhance gross and fine motor development.
Marilyn Jussel	116	COMPUTER - HANDS ON K-12 Teachers Participants will learn how to use pre-programmed software (MECC) on the Apple microcomputer and will also become familiar with types of computer-assisted-instruction.

APPENDIX F

Energy Conservation Activity Packets

Pilot Schools

ECAP Project - Pilot Schools

The following list is a compilation of those 38 school districts that participated in the ECAP pilot project. The one-year project was administered by the NEO in cooperation with several teacher training institutions. A coordinator was selected at each institution to make periodic visits to the participating districts.

University of Nebraska-Lincoln

Coordinator: El. Educ. Faculty

Omaha Westside Community School
Lincoln Public Schools
Seward Public Schools
Crete Public Schools
Beatrice Public Schools
Norris School District
at Firth
Blessed Sacrament School-Lincoln
Columbus Public Schools
Plateville Rural Dist. #2
Children's Museum-Omaha
Fremont Public Schools

Kearney State College

Coordinator: Dr. Lynn Johnson

Kearney Public Schools
Gibbon Public Schools
Minden Public Schools
Ord Public Schools
North Platte Public Schools
McCook Public Schools
Trenton Public Schools

Wayne State College

Coordinator: Dr. Lyle Skov

South Sioux City Community Schools
Norfolk Public Schools
Laurel Public Schools
Plainview Public Schools
Osmond Public Schools
Harrington Public Schools
St. Wenceslaus School--Dodge, NE
Scribner Public Schools

Chadron State College

Coordinator: Dr. Roger Wess

Chadron Public Schools
Gering Public Schools
Kimball Public Schools
Dawes County Rural Schools
Sioux County Rural Schools
Rushville Public Schools

Peru State College

Coordinator: El. Educ. Faculty

Nebraska City Public Schools
Johnson-Brock Public Schools
Tecumseh Public Schools
Plattsmouth Public Schools

APPENDIX G

Adjunct Study Materials

IMPLEMENTING ENERGY EDUCATION: FOCUSING ON ATTITUDES AND CONCERNS

A MODEL PROJECT

FUNDED BY

NEBRASKA STATE ENERGY OFFICE
9th FLOOR CAPITOL BUILDING
LINCOLN, NEBRASKA 68509

V. B. "Buck" Balok, Director

David C. Ulmer, Jr., Project Director
Instructor - Secondary Education
University of Nebraska - Lincoln

Larry C. Scharmann
Education Coordinator
Nebraska Energy Office

December 1981

"This material is being produced under contract with the Nebraska Energy Office with federal funds disbursed under P. L. 94-163 and P. L. 94-385."

GENERAL WILLIAM MITCHELL HIGH SCHOOL

LOUIS D MIKKELSEN, *Principal*
JAIME McCLENDON, *Assistant Principal*

1205 POTTER DRIVE
COLORADO SPRINGS, COLORADO 80909

December 18, 1981

Mr. Larry C. Scharmann
Education Coordinator
Nebraska State Energy Office
9th Floor Capitol Building
Lincoln, Nebraska 68509

Dear Larry,

Enclosed please find the final report for Implementing Energy Education: Focusing on Attitudes and Concerns, a model project funded by the Nebraska Energy Office.

The support and encouragement that you and the staff of the state energy office provided me played no small part in seeing this project to fruitation. In addition to the instructional staff and students who provided their time and input, I would also like to thank Dale Rathe and Neal Cross of the Lincoln Public Schools and Gary Caldwell of the Omaha Public Schools for their special assistance. Without support from people like this, a project of this magnitude would be impossible.

I trust that the observations and findings contained in this project report will, in some small way, make the big job of energy literacy for all citizens one step closer to reality.

Sincerely,

David C. Ulmer, Jr.

David C. Ulmer, Jr.
Project Director

ABSTRACT

While a large number of energy education materials have been developed in recent years, attempts to implement energy education in the classroom have met with questionable success. Factors inhibiting the infusion of energy materials into secondary school science and social studies curricula include:

1. the pervasive and overwhelming role of textbooks in establishing "the curriculum."
2. satisfaction with existing curriculum and lack of data to the contrary inhibits teacher "search behavior" for alternatives.
3. inadequate marketing schemes on the part of program developers to inform teachers of the availability of energy curriculum materials.

The Nebraska State Energy Office sought, through this project, to deal with some of the forementioned factors. Specifically, both teacher and student energy attitudes and behaviors were measured using the Youth Energy Survey and a modification of it; the Adult Energy Survey. Each participating teacher's concern about energy education as an innovation was measured using the Stages of Concern Questionnaire. A marketing plan involving feedback of student energy attitudes and behaviors to teachers was tested.

Highlights of the project, involving 42 secondary science and social studies and 3100 students in 11 high schools in Lincoln and Omaha, Nebraska, were:

1. There appears to have been little change in students' overall energy attitudes between 1979 and 1981.
2. There is no relationship between teacher energy attitudes and student energy attitudes.
3. Significant energy attitude differences were observed in teachers with different stages of concern about energy education.
4. There is no relationship between a teacher's stage of concern about energy education and his/her propensity to request energy curriculum materials.
5. Teachers with knowledge of their students' energy attitudes and behaviors do exhibit significantly increased "search behavior' for curricular alternatives.

I. BACKGROUND

The energy challenge facing this country appears to be as much one of vision as it does of resources. Since energy became a political, social, economic, and technological issue in the early 1970's, so much has been written and verbalized on the subject that to deal with it in a comprehensive manner has become a problem in dealing with the problem.

Not the least of the problems has been the plethora of energy education materials generated by commercial interests, federal and state agencies, state and local educational systems, and organizations such as Energy and Man's Environment and the National Science Teachers Association. (Allen, 1980, p. 37) The time, talent, and effort of teams of educators have generated scores of energy packets, lessons, and units. Aspects of energy issues ranging from atoms to water have been rendered in a form designed to make infusion of "energy" into the existing curriculum as easy as possible for classroom teachers. Short of adding a new unit or a new course to education's "coat of many colors" (Hofman and Miller, 1980, p. 19), infusion of new material into existing programs seems to hold the greatest promise as a way to incorporate energy into the curriculum. (Allen, 1980, p. 37)

Running counter to the infusion process are some disturbing findings related to the use of textbooks.

> "Textbooks exert an overwhelming dominance over the science learning experience. 90 to 95 percent of 12,000 teachers surveyed indicated they used texts 90 percent of the time. Behind every teacher-learner transaction...lay an instructional product waiting to play a dual role as medium and message. Textbooks command teachers' and learners' attention. Curriculum does not venture beyond the boundaries set by the instructional materials." (Harms and Yager, 1981, p. 115)

The pre-occupation that most educators have with academic preparation of their students is further highlighted:

> "The apparent primary goal of most...teachers appears to be that of teaching 'fundamental knowledge' which is necessary for later course work. Goals related to preparation..in the personal, societal, and career choice arenas, and goals related to inquiry appear to receive very little attention from teachers. The strongest evidence for this conclusion is the almost total reliance on textbooks, the nature of the textbooks themselves, and the fact that teachers choose these textbooks..." (Harms and Yager, 1981, p. 118)

Textbooks, as the medium and the message, further block the use of infusible energy education materials by inhibiting "search behavior." It has been suggested that a great deal of the inertia of "going concerns" may be attributed to habit. "Persistance comes about primarily because the individual or organization does not search for or consider alternatives to the present course of action unless the present course is in some sense 'unsatisfactory.' The amount of search decreases as satisfaction increases." (March and Simon, 1958, p. 173) Habit restricts search. The greater the habitation to a way or means of doing something, the less the propensity to search for alternatives. (March and Simon, 1958, p. 105)

The unquestioned dominance of textbooks as "the curriculum" makes infusion of new curriculum orders of magnitude more complex than maintaining satisfactory and long standing curriculum. "Most human decision-making, whether individual or organizational, is concerned with discovery and selection of satisfactory alternatives; only in exceptional cases is it concerned with discovery and selection of optimal alternatives." (March and Simon, 1958, p. 140)

The other side of the textbook domination coin is teacher nonfamiliarity with the existance of alternative energy education materials. A study prepared for the U. S. Department of Energy by Battelle's Columbus Laboratories concluded, among other things, that the extent of use of DOE energy education curriculum materials appears quite limited in our nation's schools. "A principal reason for low extent of use is that significant numbers of teachers do not know the materials exist. In addition, for teachers that are aware of the materials and that have ordered them, significant numbers do not use the materials once they receive them." (U. S. Department of Energy, 1979, p. 45)

A parallel situation is reported in teacher use and knowledge of population education materials. Two national samples of teachers (N = 2302) were surveyed to determine their use and awareness of 20 specific population education items. Two bogus items were included in the list to check respondent overstatement of material awareness and use. The 1974 sample (N = 593) showed an average of 61% were not familiar with the materials. In 1976 a replication of the survey was done using a stratified sample (N = 1709) to reflect national proportions of teachers in general science, environmental and earth science, biology, and social studies. 70% of this sample indicated non-familiarity with the population materials. Details show that for some of the materials the percentage of teachers who report they are not familiar with them as high as 89%. No single item was used by greater than 37% of either the 1974 or 1976 sample. The 1976 survey showed an average of almost 14% use of the two bogus items. "These results reinforce the view that nonfamiliarity with the materials appears to be the fundamental restriction on their use." (O'Brien, Huether, and Philliber, 1978, p. 437)

A statewide survey of science and social studies chairpersons conducted by the Nebraska State Energy Office in February 1981 substantiates a point; while funding has been provided for development of energy education materials, precious little time or man power is devoted to material distribution, implementation schemes and "after-care" activities to assist classroom teachers with the infusion process. Of 356 Nebraska School Districts responding to the survey, 78% indicated they had not ordered or received the Nebraska Basic Teaching Units on Energy (BTU's).

90 Nebraska secondary science and social studies teachers participated over the course of three summers (1977, 1978, 1980) in Curriculum Development Workshops in Energy Education. The Education Programs Division, U. S. Department of Energy furnished $62,000 for the three 3 week workshops co-sponsored by Teachers College University of Nebraska - Lincoln and the Nebraska State Energy Office.

The three summer workshops produced 29 selfcontained ready to teach units (BTU's) for secondary science and social studies classes. Participants in the 1978 workshop mentioned that one of the objectives for attending the workshop was to "write curriculum material to be used in the classroom." (McCurdy, 1978)

No mention is made of any plan for dissemination and implementation of the BTU's once they were developed. This substantiates the observation that "after-care" activities may be the most neglected phase of the research, development and dissemination triad of new curriculum programs. (Becher and Maclure, 1978, p. 112)

Curriculum implementation problems are not unique to energy education. According to Beauchamp the foremost problem confronting the curriculum field is:

"The missing link in American curriculum engineering is the process of curriculum implementation. Implementation may be thought of as a process of moving so as to ensure that the curriculum is used by teachers as a point of departure for the development of their teaching strategies. It is the means of transmitting the spirit and the content of the planned curriculum into the instructional process. More specifically, it may be thought of as the transition from the relatively static nature of the curriculum to an action strategy. Functionally, one may visualize the implementation process through the work of a teacher who has before him or her the curriculum in one hand, and whatever device that a teacher uses for developing a teaching strategy in the other hand. Implementation is the process of crossing over from one of these types of entry to another.

We have quite a history in the United States of having planned curricula, but having little or no notion as to whether these curricula have been implemented. The stereotypic tale of the teacher who hides the curriculum in the lower right hand drawer of the desk, so that it will not interfere with his or her customary approaches to teaching, is a familiar one to all of us...Where a commitment has been made... that is expressed in the form of a planned curriculum, not to implement that curriculum...is to waste the human effort involved in its planning." (Beauchamp, 1978, p. 406)

II. THE PROBLEM

A large number of energy education materials have been developed in various formats in recent years. Factors working to inhibit the infusion of these energy materials into secondary school science and social studies curricula include:

1. The pervasive and overwhelming role of textbooks in establishing "the curriculum."
2. Satisfaction with existing curriculum and lack of data to the contrary inhibits teacher "search behavior" for alternatives.
3. Inadequate marketing schemes on the part of program developers to inform teachers of the availability of energy curriculum materials.

Too often change agents seem to act on blind faith that sheer distribution of curriculum materials to teachers will cause implementation to "happen." Innovation merit alone does not seem to convince teachers of the need to change. Dissatisfaction with the status quo comes with data supporting the need for improvement.

III. THE RESEARCH QUESTIONS

The Nebraska State Energy Office sought, through this project, to deal with some of the problems previously outlined. Specifically, both teacher and student attitudes toward energy conservation were measured; each participating teacher's stage of concern regarding energy education was evaluated; and a marketing plan involving feedback of student energy attitudes to teachers was tested. The research questions and their rationale follow:

1. WHAT ARE SECONDARY PUBLIC SCHOOL STUDENTS' ENERGY ATTITUDES AND AND BEHAVIORS?

   RATIONALE: A descriptive survey of energy attitudes and behaviors of high school students in Nebraska allows comparison with baseline scores established during a pilot study in 1979.

2. WHAT ARE SECONDARY PUBLIC SCHOOL TEACHERS' ENERGY ATTITUDES AND BEHAVIORS?

   RATIONALE: A parallel "adult" version of the Youth Energy Survey (i) should encourage teachers to discuss the survey with their students after administering it and (ii) provide a baseline measure of Nebraska adult energy attitudes and behaviors.

3. IS THERE A RELATIONSHIP BETWEEN A TEACHER'S ENERGY ATTITUDES AND HIS/HER CLASSES' ENERGY ATTITUDES?

   NULL HYPOTHESIS H_1: THERE IS NO RELATIONSHIP BETWEEN TEACHER ENERGY ATTITUDES AND STUDENT ENERGY ATTITUDES.

   RATIONALE: Unless energy education has played a significant and long term role in the curriculum, there is no reason to suggest any relationship between the teacher's energy attitudes and their students' attitudes.

4. IS THERE A RELATIONSHIP BETWEEN A TEACHER'S STAGE OF CONCERN ABOUT ENERGY EDUCATION AS AN INNOVATION AND HIS/HER ENERGY ATTITUDES?

   NULL HYPOTHESIS H_2: THERE IS NO RELATIONSHIP BETWEEN A TEACHER'S STAGE OF CONCERN ABOUT ENERGY EDUCATION AS AN INNOVATION AND HIS/HER ENERGY ATTITUDES.

RATIONALE: As one's stage of concern about energy education shifts from the awareness/informational level to the management/consequence/collaboration level one would expect a concurrent shift in energy attitudes, i.e., internalization of energy education as an important educational issue is reflected by more positive energy attitudes.

5. IS THERE A RELATIONSHIP BETWEEN TEACHER'S CONCERNS ABOUT ENERGY EDUCATION AND THEIR TENDENCY TO ADHERE TO ESTABLISHED CURRICULAR PROGRAMS?

NULL HYPOTHESIS H_3: THERE IS NO RELATIONSHIP BETWEEN A TEACHER'S STAGE OF CONCERN ABOUT ENERGY EDUCATION AS AN INNOVATION AND HIS/HER PROPENSITY TO REQUEST ENERGY CURRICULUM MATERIALS.

RATIONALE: This item tries to identify the point or points on the stages of concern scale where teachers are most likely to want to examine energy curriculum materials. Intuition suggests that those at the awareness and information level of concern would be most likely to want to examine energy curriculum materials.

6. IS THERE A RELATIONSHIP BETWEEN TEACHERS WITH KNOWLEDGE OF THEIR STUDENTS' ENERGY ATTITUDES AND BEHAVIORS AND TEACHERS WITHOUT THAT KNOWLEDGE IN THEIR TENDENCY TO ADHERE TO ESTABLISHED CURRICULUM PROGRAMS?

NULL HYPOTHESIS H_4: THERE IS NO RELATIONSHIP BETWEEN TEACHERS WITH KNOWLEDGE OF THEIR STUDENTS' ENERGY ATTITUDES AND BEHAVIORS AND TEACHERS WITHOUT THAT KNOWLEDGE IN THEIR PROPENSITY TO REQUEST ENERGY CURRICULUM MATERIALS.

RATIONALE: Teachers with knowledge of their students' energy attitudes and behaviors have a basis for concern about energy as an educational issue. One way this concern may be exhibited is to request copies of energy curriculum materials.

STAGES OF CONCERN ABOUT INNOVATION

0 AWARENESS: Little concern about or involvement with the innovation is indicated.

1 INFORMATIONAL: A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about herself/himself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.

2 PERSONAL: Individual is uncertain about the demands of the innovation, her/his inadequacy to meet those demands, and her/his role with the innovation. This includes analysis of her/his role in relation to the reward structure of the organization, decision making, and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.

3 MANAGEMENT: Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.

4 CONSEQUENCE: Attention focuses on impact of the innovation on students in her/his immediate sphere of influence. The focus is on relevance of the innovation for students, evaluation of student outcomes, including performance and competencies, and changes needed to increase student outcomes.

5 COLLABORATION: The focus is on coordination and cooperation with others regarding use of the innovation.

6 REFOCUSING: The focus is on exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.

From a similar table in Hall, George, and Rutherford, Measuring Stages of Concern About the Innovation: A Manual for Use of the SoC questionnaire - Second Edition, R & D Center for Teacher Education, The University of Texas at Austin, 1979, p. 7.

STATEMENTS ON THE STAGES OF CONCERN QUESTIONNAIRE
ARRANGED ACCORDING TO STAGE

Item Number	Statement
	STAGE 0
3	I don't even know what the innovation is.
12	I am not concerned about this innovation.
21	I am completely occupied with other things.
23	Although I don't know about this innovation, I am concerned about things in the area.
30	At this time, I am not interested in learning about this innovation.
	STAGE 1
6	I have a very limited knowledge about the innovation.
14	I would like to discuss the possibility of using the innovation.
15	I would like to know what resources are available if we decide to adopt this innovation.
26	I would like to know what the use of the innovation will require in the immediate future.
35	I would like to know how this innovation is better than what we have now.
	STAGE 2
9	I would like to know the effect of reorganization on my professional status.
13	I would like to know who will make the decisions in the new system.
17	I would like to know how my teaching or administration is supposed to change.
28	I would like to have more information on time and energy commitments required by this innovation.
33	I would like to know how my role will change when I am using the innovation.
	STAGE 3
4	I am concerned about not having enough time to organize myself each day.
8	I am concerned about conflict between my interests and my responsibilities.
16	I am concerned about my inability to manage all the innovation requires.
25	I am concerned about time spent working with non-academic problems related to this innovation.
34	Coordination of tasks and people is taking too much of my time.
	STAGE 4
1	I am concerned about students' attitudes toward this innovation.
11	I am concerned about how the innovation affects students.
19	I am concerned about evaluating my impact on students.
24	I would like to excite my students about their part in this approach.
32	I would like to use feedback from students to change the program.
	STAGE 5
5	I would like to help other faculty in their use of the innovation.
10	I would like to develop working relationships with both our faculty and outside faculty using this innovation.
18	I would like to familiarize other departments or persons with the progress of this new approach.
27	I would like to coordinate my effort with others to maximize the innovation's effects.
29	I would like to know what other faculty are doing in this area.
	STAGE 6
2	I now know of some other approaches that might work better.
7	I am concerned about revising my use of the innovation.
20	I would like to revise the innovation's instructional approach.
22	I would like to modify our use of the innovation based on the experiences of our students.
31	I would like to determine how to supplement, enhance, or replace the innovation.

From Measuring Stages of Concern About the Innovation: Manual for Use of SoC Questionnaire, 1979, p. 25.

V. THE FINDINGS

The six research questions asked in section III are repeated in the pages that follow. Data answering these questions is highlighted along with supporting data tables.

Research questions 1 and 2 are merely descriptive of student and teacher energy attitudes and behaviors. There appears to have been little change in students' overall energy attitudes between 1979 and 1981.

Null Hypothesis H_1 (question 3) was accepted. There is no relationship between teacher energy attitudes and student energy attitudes.

Null Hypothesis H_2 (question 4) was conditionally rejected. Significant attitude differences on five of ten scales were observed in teachers with different stages of concern about energy education.

Null Hypothesis H_3 (question 5) was accepted. There is no relationship between a teacher's stage of concern about energy education and his/her propensity to request energy curriculum materials.

Null Hypothesis H_4 (question 6) was rejected. Teachers with knowledge of their students' energy attitudes and behaviors do exhibit significantly increased "search behavior" for curricular alternatives by requesting energy curriculum materials from the state energy office.

energy

ATTITUDES AND BEHAVIORS

WHAT?

Would you like to have a measure of your students' attitudes and behaviors as they relate to energy and energy conservation issues?

WHY?

The economic, social and technological impact of the energy problem as it affects everyone's lifestyle continues to be a focal point of debate and controversy. The implications for all educators and their students are significant and long term.

HOW?

The Youth Energy Survey (YES), developed by the Michigan Energy Extension Service, can provide you with some real insight into your students' energy attitudes and behaviors. The 78 item survey instrument has been tested in 8 states involving some 40,000 students. The instrument provides an overall score and sub-scores in 9 energy related categories. It takes 25 minutes of class time to administer.

YOU GET

In exchange for 25 minutes of your class time you will receive:

- Attitude scores for your class in each of 9 categories as well as an overall comprehensive score.
- Comparative scores for other schools in your district.
- Comparative scores from the 8 state sample used to develop the instrument initially.
- Assistance in interpreting the results for your class.
- The option of receiving, for use with your class, some new energy education teaching materials.

INTERESTED?

The Youth Energy Survey stands as perhaps the single most reliable energy attitude survey instrument available in the country today. The opportunity to participate is being made available through a project funded by the Nebraska Energy Office. IF YOU AND YOUR CLASS WOULD LIKE TO BE CONSIDERED AS PARTICIPANTS IN THE PROJECT, PLEASE COMPLETE AND RETURN THE FORM BELOW. THANK YOU FOR YOUR TIME AND INTEREST.

NAME _____

SCHOOL _____

SUBJECT _____

GRADE LEVEL _____

NUMBER OF STUDENTS _____

QUESTION?
Call Dave Ulmer
472-2018
University of Nebraska

Please return via SCHOOL MAIL TO:
Dale Rathe/Energy
Box 41 PSAB

Energy Extension Service

YOUTH ENERGY SURVEY

INSTRUCTIONS

This questionnaire is designed to gather information on attitudes toward energy conservation. It has three parts. Part one, DESCRIPTIVE INFORMATION asks about your individual characteristics, such as age. Part two, YOUTH ENERGY ATTITUDES, asks about your attitudes toward energy issues. Part three, ENERGY CONSERVATION TASKS, asks about action you may have taken to conserve energy. In each part of the questionnaire please mark your answer to the questions by darkening the corresponding answer circle.

- IMPORTANT: Use black lead #2 pencil only. (DO NOT use ink, color, or other pencil.)
- Make heavy black marks that fill the circle completely.
- Erase cleanly and carefully any answer you wish to change.
- Make no stray marks on the answer sheet.

Example: Proper Mark ● Improper Marks ⊘ ✓ ✗

If you have any questions, ask your teacher.

WRITE TEACHER'S NAME _____

BIRTH DATE

MONTH	DAY	YEAR
JAN ○	0 0	0
FEB ○	1 1	1
MAR ○	2 2	2
APR ○	3 3	3
MAY ○	4	4
JUN ○	5	5 5
JUL ○	6	6 6
AUG ○	7	7
SEP ○	8	8
OCT ○	9	9
NOV ○		
DEC ○		

YOUR SEX: Male ○ Female ○

INITIALS

FIRST	LAST
A N	A N
B O	B O
C P	C P
D Q	D Q
E R	E R
F S	F S
G T	G T
H U	H U
I V	I V
J W	J W
K X	K X
L Y	L Y
M Z	M Z

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DO NOT WRITE IN THIS SPACE

DESCRIPTIVE INFORMATION

1. Your grade in school? ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫
2. Your age? ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲
3. Approximately what is your average grade in school? Ⓐ Ⓐ Ⓑ+ Ⓑ Ⓑ Ⓒ+ Ⓒ Ⓒ Ⓓ
4. How many persons, including yourself, live in your home? ① ② ③ ④ ⑤ ○ over 5
5. How many bedrooms does your home have? ① ② ③ ④ ⑤ ○ over 5
6. Do you live within 1 mile of your school? ○ Yes ○ No
7. Do you own your own car? ○ Yes ○ No
8. If you answered "Yes" to number 7 would you call your own car a ... Subcompact ○ Compact ○ Midsized ○ Full-sized ○
9a. How many cars (not including your car) does your family own? ⓪ ① ② ○ over 2
9b. Would you call your largest (or only) family car a ... Subcompact ○ Compact ○ Midsized ○ Full-sized ○
10. Do you live in a(an) ... Apartment ○ Condominium ○ Duplex ○ House ○ Mobile Home ○
11. Do you live in a ... ○ City ○ Suburb ○ Small Town ○ Rural Area
12. In how many of your courses in this school year have you studied about energy conservation? ... 0 ○ 1 ○ 2 ○ 3 or more ○
13. About how many class hours on energy conservation have you had? ... ⓪ ① ② ③ ④ ○ 5-10 ○ over 10
14. Have you ever been given a school assignment to try and save energy in your home or car? ... ○ Yes ○ No
15. Has this teacher (name you wrote above) taught you about energy conservation in his/her class? ... ○ Yes ○ No
16. Approximately how many total pages of information about energy have you read in the past week? ... 0 ○ 1-5 ○ 6-10 ○ 11-20 ○ over 20 ○

YOUTH ENERGY ATTITUDES

(Note: SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree)

17. New ways to conserve energy should not be developed if my taxes have to be increased to pay for them ... SA A U D SD
18. I would be willing to use air conditioning less often in the summer to save energy ... SA A U D SD
19. I would ride my bike or walk rather than ride in a car if it helped save energy ... SA A U D SD
20. I am willing to change my life-style to conserve energy ... SA A U D SD
21. I am willing to attend football games right after school (instead of at night) to save lighting energy ... SA A U D SD
22. Energy conservation should be one of the most important concerns of people my age ... SA A U D SD
23. I am willing to spend 4 hours caulking the windows in our house or apartment ... SA A U D SD
24. I would like my family to keep the thermostat below 70° in our house to save energy ... SA A U D SD
25. The best way for a person to deal with the energy shortage is to let the scientists worry about it ... SA A U D SD
26. Conserving energy will cause people to lose jobs ... SA A U D SD
27. I would like my parents to buy solar collectors for the roof of our house or apartment ... SA A U D SD
28. Our state government should make energy conservation a high priority ... SA A U D SD
29. I would like my parents to insulate or otherwise reduce our use of energy for home heating ... SA A U D SD
30. I favor conserving energy rather than building more power plants ... SA A U D SD
31. The effort made by individuals to conserve energy can have a major impact on our energy problem ... SA A U D SD
32. The government should spend a larger portion of their present budget on energy conservation ... SA A U D SD
33. I would be willing to have our house warmer in the summer to save the energy used by air conditioning ... SA A U D SD

NCS Trans-Optic 10-6742-32

Energy Extension Service

YOUTH ENERGY SURVEY - side two

Continue answering questions - Remember: SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree

34. I would not really change the way I do things just to help save energy ..... SA A U D SD
35. I would like to help my family reduce the use of electrical energy in our home ..... SA A U D SD
36. I favor the increased use of nuclear power ..... SA A U D SD
37. Activities which save energy can develop into more jobs for people ..... SA A U D SD
38. I am willing to attend regular weekly meetings of a neighborhood energy conservation association ..... SA A U D SD
39. I would like my parents to buy an energy efficient car the next time they buy a car ..... SA A U D SD
40. I am willing to drive 55 mph or slower to save gasoline ..... SA A U D SD
41. Solving our energy problems through energy conservation will cost less than building new power plants ..... SA A U D SD
42. I am willing to help my family build a solar water heater ..... SA A U D SD
43. I am willing to spend 4 hours helping my family better insulate our house or apartment ..... SA A U D SD
44. I would <u>not</u> favor new laws being passed to help save energy if it meant extra work for me ..... SA A U D SD
45. Government should use taxes to increase energy conservation ..... SA A U D SD
46. Individuals like myself should not be expected to help pay the cost of finding new ways to conserve energy ..... SA A U D SD
47. Cars should be taxed by miles per gallon so that owners of more efficient cars pay less ..... SA A U D SD
48. I would like to spend 4 hours doing volunteer work on energy conservation ..... SA A U D SD
49. I would like to help build a solar collector on the roof of our house or apartment ..... SA A U D SD
50. I am willing to ride a bus to in-town recreational events ..... SA A U D SD
51. My individual efforts can help solve the energy problem ..... SA A U D SD
52. I would like to help build a windmill to provide energy for our house ..... SA A U D SD
53. Property taxes should be higher for the homes of people that use larger quantities of energy ..... SA A U D SD
54. I should be able to use the energy I need to be comfortable and not be required to conserve energy SA A U D SD
55. I would appreciate it if my parents would carpool with neighbors ..... SA A U D SD
56. I am willing to take cooler showers or baths to save energy ..... SA A U D SD
57. The country should rely more on nuclear power to supply our energy needs ..... SA A U D SD
58. I am willing to spend 4 hours helping other people make their homes energy efficient ..... SA A U D SD
59. The federal government should make energy conservation a high priority ..... SA A U D SD
60. I would like my family members to drive less and walk or ride a bike more ..... SA A U D SD
61. I don't worry about conserving energy because technology will solve the energy problem ..... SA A U D SD
62. By making slight changes, individuals like myself can help save energy ..... SA A U D SD
63. Energy conservation will produce more jobs ..... SA A U D SD
64. Saving our limited supply of energy is one of our nation's most serious problems ..... SA A U D SD

ENERGY CONSERVATION TASKS

NOTE: Please indicate whether or not any of the tasks listed below have been completed in the past six months.

IN LAST SIX MONTHS, HAS YOUR <u>FAMILY</u>

65. Added three inches or more of insulation to your home ..... Yes No
66. Caulked or weatherstripped your home's doors or windows ..... Yes No
67. Lowered the thermostat by three degrees or more ..... Yes No
68. Traded in a large car for a smaller one ..... Yes No
69. Installed a solar collector ..... Yes No
70. Carpooled ten times or more ..... Yes No
71. Put blankets or plastic over windows to save heat ..... Yes No
72. Installed a wood burning heater or wood burning stove ..... Yes No

IN THE LAST SIX MONTHS, HAVE <u>YOU</u>

73. Asked your parents to do any of the above tasks ..... Yes No
74. Helped someone insulate, caulk, or weatherstrip a home (including your own) ..... Yes No
75. Talked to your parents about the need to conserve energy ..... Yes No
76. Chosen at least 5 times to walk or ride bus to school instead of riding in a car ..... Yes No
77. Turned off lights to save electricity more than 10 times ..... Yes No
78. Calculated your own or your family's gas mileage ..... Yes No
79. Taken a cooler or shorter shower to save hot water ..... Yes No
80. Ridden in a public bus (not a school bus) over three times ..... Yes No
81. Tried to save gasoline by driving or riding in a car less ..... Yes No
82. (Optional question #1) ..... Yes No
83. (Optional question #2) ..... Yes No
84a. Conserved energy in any other way ..... Yes No

DO NOT WRITE IN THIS SPACE

84b. If you answered "yes" to question 84a, please describe below what else you did to conserve energy. (WRITE ONLY IN THE SPACE BELOW)

DO NOT WRITE IN THIS SPACE

CHARLES THONE
GOVERNOR

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WILLIAM H. PALMER
DIRECTOR

CONCERNS QUESTIONNAIRE REGARDING ENERGY EDUCATION

The purpose of this questionnaire is to determine wnat people who are thinking about using various programs are concerned about at various times during the innovation adoption process. The items were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years experience in using them. Therefore a good part of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time. For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

This statement is very true of me at this time.	0	1	2	3	4	5	6	(7)
This statement is somewhat true of me now.	0	1	2	3	(4)	5	6	7
This statement is not at all true of me at this time.	0	(1)	2	3	4	5	6	7
This statement seems irrelevant to me.	(0)	1	2	3	4	5	6	7

Please respond to the items in terms of your present concerns, or how you feel about your involvement or potential involvement with Energy Education. We do not hold to any one definition of this innovation, so please think of it in terms of your own perception of what it involves. Since this questionnaire is used for a variety of innovations, the name Energy Education never appears. However, phrases such as "the innovation," "this approach," and "the new system" all refer to Energy Education. Remember to respond to each item in terms of your present concerns about your involvement or potential involvement with Energy Education.

Thank you for taking time to help us learn more about teaching staff concerns regarding Energy Education in Nebraska.

David C. Ulmer, Jr.
Instructor
Teachers College, UNL

Larry Scharmann
Education Coordinator
Nebraska Energy Office

CONCERNS QUESTIONNAIRE

0	1	2	3	4	5	6		7
Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now		

1.	I am concerned about students' attitudes toward this innovation.	0	1	2	3	4	5	6	7
2.	I now know of some other approaches that might work better.	0	1	2	3	4	5	6	7
3.	I don't even know what the innovation is.	0	1	2	3	4	5	6	7
4.	I am concerned about not having enough time to organize myself each day.	0	1	2	3	4	5	6	7
5.	I would like to help other faculty in their use of the innovation.	0	1	2	3	4	5	6	7
6.	I have a very limited knowledge about the innovation.	0	1	2	3	4	5	6	7
7.	I would like to know the effect of reorganization on my professional status.	0	1	2	3	4	5	6	7
8.	I am concerned about conflict between my interests and my responsibilities.	0	1	2	3	4	5	6	7
9.	I am concerned about revising my use of the innovation.	0	1	2	3	4	5	6	7
10.	I would like to develop working relationships with both our faculty and outside faculty using this innovation.	0	1	2	3	4	5	6	7
11.	I am concerned about how the innovation affects students.	0	1	2	3	4	5	6	7
12.	I am not concerned about this innovation.	0	1	2	3	4	5	6	7
13.	I would like to know who will make the decisions in this new system.	0	1	2	3	4	5	6	7
14.	I would like to discuss the possibility of using the innovation.	0	1	2	3	4	5	6	7
15.	I would like to know what resources are available if we decide to adopt this innovation.	0	1	2	3	4	5	6	7
16.	I am concerned about my inability to manage all the innovation requires.	0	1	2	3	4	5	6	7
17.	I would like to know how my teaching or administration is supposed to change.	0	1	2	3	4	5	6	7
18.	I would like to familiarize other departments or persons with the progress of this new approach.	0	1	2	3	4	5	6	7

(CONTINUED ON REVERSE SIDE)

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	0 Irrelevant	1 Not true of me now	2	3 Somewhat true of me now	4	5	6 Very true of me now	7

19.	I am concerned about evaluating my impact on students.	0	1	2	3	4	5	6	7
20.	I would like to revise the innovation's instructional approach.	0	1	2	3	4	5	6	7
21.	I am completely occupied with other things.	0	1	2	3	4	5	6	7
22.	I would like to modify our use of the innovation based on the experiences of our students.	0	1	2	3	4	5	6	7
23.	Although I don't know about this innovation, I am concerned about things in the area.	0	1	2	3	4	5	6	7
24.	I would like to excite my students about their part in this approach.	0	1	2	3	4	5	6	7
25.	I am concerned about time spent working with non-academic problems related to this innovation.	0	1	2	3	4	5	6	7
26.	I would like to know what the use of the innovation will require in the immediate future.	0	1	2	3	4	5	6	7
27.	I would like to coordinate my effort with others to maximize the innovation's effects.	0	1	2	3	4	5	6	7
28.	I would like to have more information on time and energy commitments required by this innovation.	0	1	2	3	4	5	6	7
29.	I would like to know what other faculty are doing in this area.	0	1	2	3	4	5	6	7
30.	At this time, I am not interested in learning about this innovation.	0	1	2	3	4	5	6	7
31.	I would like to determine how to supplement, enhance, or replace the innovation.	0	1	2	3	4	5	6	7
32.	I would like to use feedback from students to change the program.	0	1	2	3	4	5	6	7
33.	I would like to know how my role will change when I am using the innovation.	0	1	2	3	4	5	6	7
34.	Coordination of tasks and people is taking too much of my time.	0	1	2	3	4	5	6	7
35.	I would like to know how this innovation is better than what we have now.	0	1	2	3	4	5	6	7

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REFERENCES

REFERENCES

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